UNIV. OF MICH.
OCT 9 1908

Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Sound Waves, Telephone Magazine, and The Telephone
PUBLISHED WEEKLY BY THE TELEPHONY PUBLISHING COMPANY, MONADNOCK BLOCK, CHICAGO

VOL. XVI. No. 9 — CHICAGO, OCTOBER 10, 1908 — 10 CENTS PER COPY
$2 PER YEAR TO U. S., CANADA AND MEXICO
$3 PER YEAR TO OTHER COUNTRIES

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1889 Paris Exposition Medal for Rubber Insulation 1893 World's Fair Medal for Rubber Insulation
THE STANDARD FOR RUBBER INSULATION
OKONITE WIRES, OKONITE TAPE, MANSON TAPE, CANDEE PAT'D POTHEADS
THE OKONITE CO., Ltd. Sole Manufacturers 253 Broadway, New York
WILLARD L. CANDEE, H. DURANT CHEEVER, MANAGERS. W. H. HODGINS, SECRETARY. GEO. S. MANSON, SUPERINTENDENT. W. C. CANDEE, ASST. SECRETARY.
OKONITE TRADE MARK REG. U.S. PAT. OFFICE

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CLAY PRODUCT COMPANY
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BRIGHT COLD ROLLED AND COLD DRAWN
NORWAY IRON, MAGNET STEEL
Cold Drawn Steel Rounds, Flats, Square, Hexagons.
COLD ROLLED STRIP STEEL
LARGE STOCK ALWAYS ON HAND.
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KERITE
Insulated Wires and Cables
1850 DAYS KERITE 1908
The Insulation which has withstood successfully the test of half a century
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CHICAGO TELEPHONES SATISFY
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FACTORY AND GENERAL OFFICES
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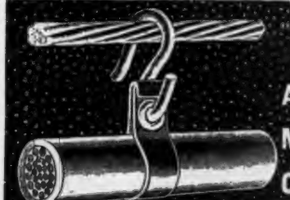
"I-LET" All Metal Cable Hanger
Costs no more than Marline, is infinitely superior. Write for sample.
Save crossarms by using our "Standard" Aerial Rings for supporting aerial cables or insulated service wires. Our rings will not slip when cable is being installed.
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ALPHABETICAL INDEX TO ADVERTISEMENTS ON PAGE 19

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We ship fresh goods to you direct from our factory

Bulletins

No. 15. — The Construction of Dry Cells

No. 16.—The Dry Cell and the Telephone Manager

Sent on Application

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FOR TELEPHONE SERVICE

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MANUFACTURERS OF

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Insulated Wires and Cables

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We Make Toll Tickets by the Million

By means of new facilities just acquired, and thus produce them better and cheaper than can be done in small lots. We can furnish them promptly in any quantity, on better paper, put up in better shape, and at LOWER PRICES THAN EVER BEFORE OFFERED.

WE ALSO FURNISH

Lease Records	Directories
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Steel Telephone Signs

All kinds of Blanks, Forms and Books for Telephone and Toll Line Accounting.

Write for Sample Forms and Prices.

THE TELEPHONE PRINTING COMPANY

DEFIANCE, OHIO

HOW TO USE THE WILLIAMS TEST CLAMP

Hold clamp between thumb and first finger, then press together, causing the jaws to open wide. Insert the wire you are to test in the valley or groove and release the pressure, allowing the needle points to come down on the insulation with a clean bite. Then with the thumb on the stud or screwcap press the jaws together firmly. This will force the needles through the insulation, making a good contact with the conductor, which contact the spring steel jaws will hold steadily while the test is made. Send 75c. for a set (2) postpaid. Your money back if you want it.

The Williams Test Clamp Co.

720 Electric Bldg. Cleveland, O.

The Wire of Quality

TELEPHONE WIRE

Best by Every Test

A Difference in Wire makes a Difference in Service.

LONGEST LIFE—HIGHEST EFFICIENCY

Universities have tested our wire and found it of the highest quality. Leading Telephone Companies use it, with perfect satisfaction in most exacting service.

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We make six designs of seats, three all steel and three with wood seats.

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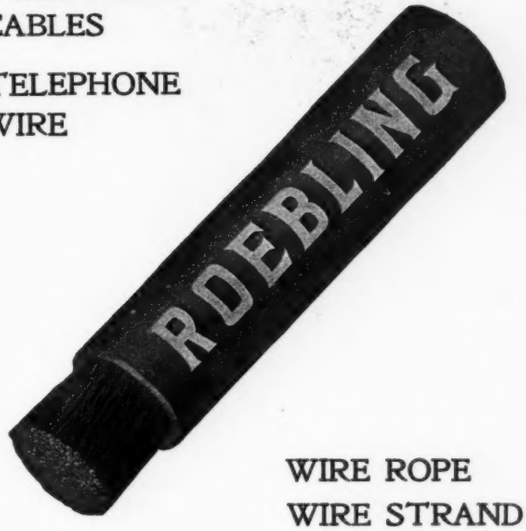
TELEPHONE CABLES

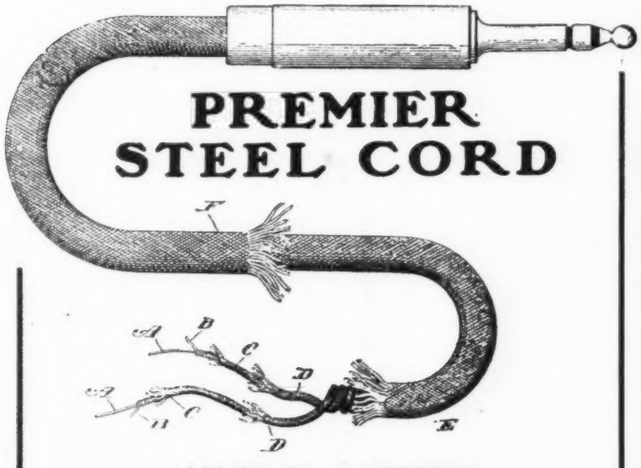
TELEPHONE WIRE



WIRE ROPE
WIRE STRAND

JOHN A. ROEBLING'S SONS CO.

TRENTON, N. J.



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ALWAYS IN ALIGNMENT

In the hollow of the cord at the plug end, there's a reinforcing spring made of the highest grade spring steel. Not only does this prevent the conductors from being thrown out of alignment, but it also makes it practically impossible to break the cord at the plug end, and that's where the strain is greatest. Operators don't have to be careful when you use Premier Steel Cord—it'll last in spite of shamefully careless usage. Better get details.

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IN YOUR STORAGE BATTERY ROOM

AMERICAN CIRCULAR LOOM CO.
TRADE MARK REGISTERED

Use Circular Loom for protecting and insulating your battery leads. Place Circular Loom around metal pipes running above the cells to protect them from fumes and to keep metal particles from falling off into the battery. It's neater and better than the ordinary boxing.

You'll find new Circular Loom uses for every day.

Order from your dealer or address

AMERICAN CIRCULAR LOOM CO.

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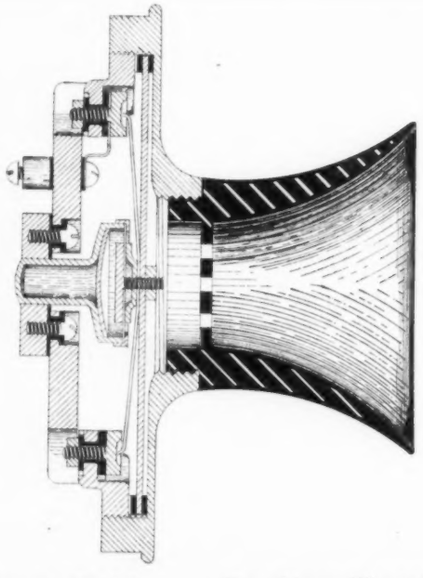
WHEN YOU order a Cracraft, Leich Telephone, you can rest assured that you will not only receive a telephone that is properly designed, but also one that is properly made. None but the best of materials are used in its construction. Our manufacturing department is equipped with the proper tools and gauges, making our product uniform and reliable.

We make every part of this telephone except the cabinet. The cabinet is made per our specifications and is the best we can buy. Telephones shipped with or without batteries as desired. Write to us. We can be of service to you.

Cracraft, Leich Electric Co., Genoa, Ill.



None Better. Do You Know

of any as good as our new solid back non-packable gold-electrode transmitter. Careful search fails to discover its peer.

SIMPLE—DURABLE—EFFICIENT

The Standard Telephone Mfg. Co.

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SUCCESSORS TO
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You are tardy, but not too late to get our new Catalog

If You Consider

THE POOLE

Lock-Out System

as an addition to party-line service, you are wrong. It is not something added—it is a feature which has always belonged to good service. It unfailingly gives absolute

SECRECY

to any of the parties on the line. It gives the subscriber all the advantages of a private line at the cost of a party line. It enables you to put more parties on a line, and get higher rates.

Now, do you want details?

Mountain State Electrical Co.,

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Do You Get Full Value?

¶ The tangible evidence that you are a careful buyer is the equipment of Magneto Telephones in your exchange system.

¶ With "Stromberg-Carlson" Magneto Telephones you get "Quality Apparatus" in an exclusive and superior form. You get a telephone consisting of ONE FACTORY products—including the cabinet which we make from selected kiln dried Golden Oak.

¶ And remember—every piece of brass—steel—iron—copper—rubber—silk, etc., in a "Stromberg-Carlson" Magneto Telephone has first passed our Electrical and Chemical Laboratory test. BUY "Quality Apparatus" THAT LASTS.

No. 7—Line Binding Posts and Carbon Block Lightning Arrester.

No. 5—Hookswitch—Its point of merit: Simplicity, good mechanical construction, positiveness of action, lever movement, such as will insure maximum pressure on contacts. There are no "floating springs."

No. 20A—Induction Coil—Both windings are so proportioned that transmission over long and short lines is a maximum for clearness, and as a receiving instrument the highest degree of efficiency is developed. Instantly removable.

Golden Oak Woodwork—Now made in our own factories from carefully selected kiln-dried oak woodwork—machine made and hand finished by expert cabinet makers. Nothing cheap.

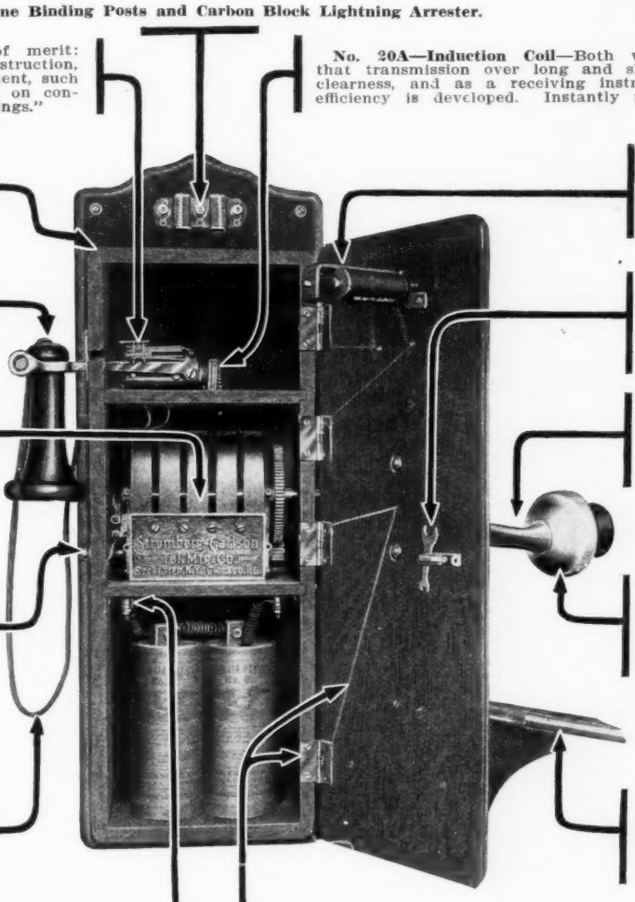
No. 6—Ringer—No design ever approached it for simplicity—durability and efficiency. Armature and clapper rod adjustment independent of ringer mounting. Special spool construction—full copper windings.

No. 14A—Receiver—The acknowledged standard for any kind of telephone work. Receiving qualities well defined and distinct. Permanent adjustment — no castings — uniform ground pole pieces. Composition shell.

This double end wrench is one of the accessories furnished for adjusting any nuts used in the construction of the various parts constituting a complete magneto telephone.

No. 24—Generator—Its high voltage output and greater permeability make it the best generator for all kinds of service. Well designed laminated carefully wound armature. Machine cut gears.

No. 10—Transmitter Arm—Made of cold drawn steel—including the base of one piece. Indestructible and adjustable. Richly enameled and hand finished. Improves the appearance of any telephone.



A screw lock that fastens door firmly. Has a spiral tension spring that keeps screw end back from lock bracket when swinging door closed.

No. 7B — Transmitter — A leading product that is out of the experimental class—producing everlastingly the maximum volume of voice transmission with excellent articulation. Every atom of carbon used is made in our own factory.

No. 7 — Receiver Cord — A braided copper tinsel conductor cord insulated with braided cotton and green spun machine silk. The best cord that you can buy. They outwear any other kind.

Some ingenuity is exercised in the design of our telephone cabinets. All corners and surfaces are made plain to simplify finishing and insure protection against breakage.

A combination machine nut binding post and soldered terminal for the batteries. This is an extra feature we provide and which will be found a great convenience.

All trimmings in "Stromberg-Carlson" instruments carefully assembled and the best we can purchase. Special terminal wires and cordage, hinges, punchings, nails, etc., are provided.

We want your trial order if you do not *know* what we say is a *fact*.

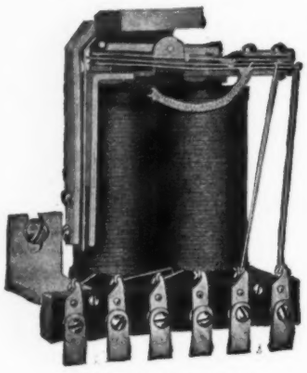
STROMBERG-CARLSON TEL.MFG.CO

ROCHESTER, NEW YORK, U.S.A.

CHICAGO, ILL. KANSAS CITY, MO.

ROBERTS Selective Ringing Secret Service SYSTEM

THIS DOES IT



ROBERTS RELAY

We can increase your revenue 50%

REVENUE

We are doing it for others

INCREASED

Are you interested?

If so write us

Homer Roberts Telephone Co.

1703 MELROSE STREET, CHICAGO

Do You Ever Borrow Money

And pay interest on it? Are you sometimes obliged to do this to meet expense and maintenance charges? How often could it be avoided if you had no expense on your subscribers stations; if all of your telephones gave lasting service and were ready for business every day in the year? Would it not be money in your pocket to pay a trifle more per telephone and know when you installed an instrument you would hear no more from it and subscribers would pay up promptly and cheerfully.

Try an Andrae Special Heavy Giant and see the difference. There are other telephones but no other Giant Telephones. It is impossible to realize the difference unless you try a comparison on your own lines, side by side with other instruments. A record of repair charges will show the Giant earning money every day.

Years of experience have shown us the difference in the materials used in telephone manufacture and taught our men what good work really means. Send us a trial order and let us prove it.

Julius Andrae & Sons Co., (48 Years Learning How) **Milwaukee**

217 West Water Street

Insulated Staples

4 Sizes

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BLAKE

TUBE FLUX for SOLDERING

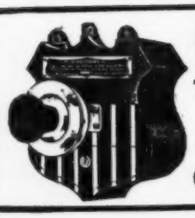
Full Size of Tube, 1" x 5"

Patented Feb. 4, '08

COMPRESSED CLEATS FOR USE ON PLASTERING

EXACT SIZE PAT. JULY 1906

BLAKE SIGNAL & MFG. CO. WRITE FOR SAMPLES 246 SUMMER ST., BOSTON, MASS.



DO YOU WANT WHAT'S DUE YOU?

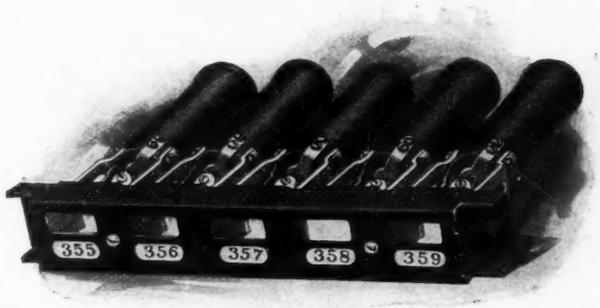
THEN INSTALL **GRAY PAY STATIONS** AND YOU'LL GET IT

All details are in Catalog No. 50. Write for a copy.

GRAY TELEPHONE PAY STATION CO., Hartford, Conn.

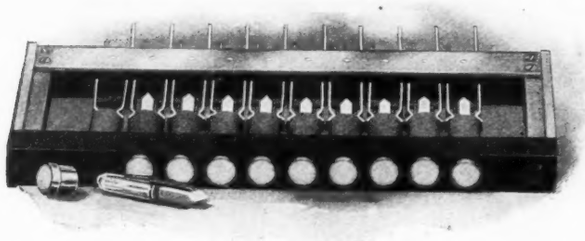
PRIVATE BRANCH EQUIPMENT

Owing to the situation of private branch exchanges---separate from the main exchange---it is of the utmost importance that they require but little attention.



The visual signals have the armature on the front of the coil, are extremely sensitive and remarkably accessible

It is essential the equipment be such that it can be depended upon to meet the most exacting requirements without needing constant care.



The lamp strips are made substantially and being practically all metal cannot warp or be otherwise injured by heat

The strong feature of Monarch equipment---mechanical perfection ---with its consequent freedom from trouble, is compelling exchange managers to recognize the economy of adopting it for Private Branch work.

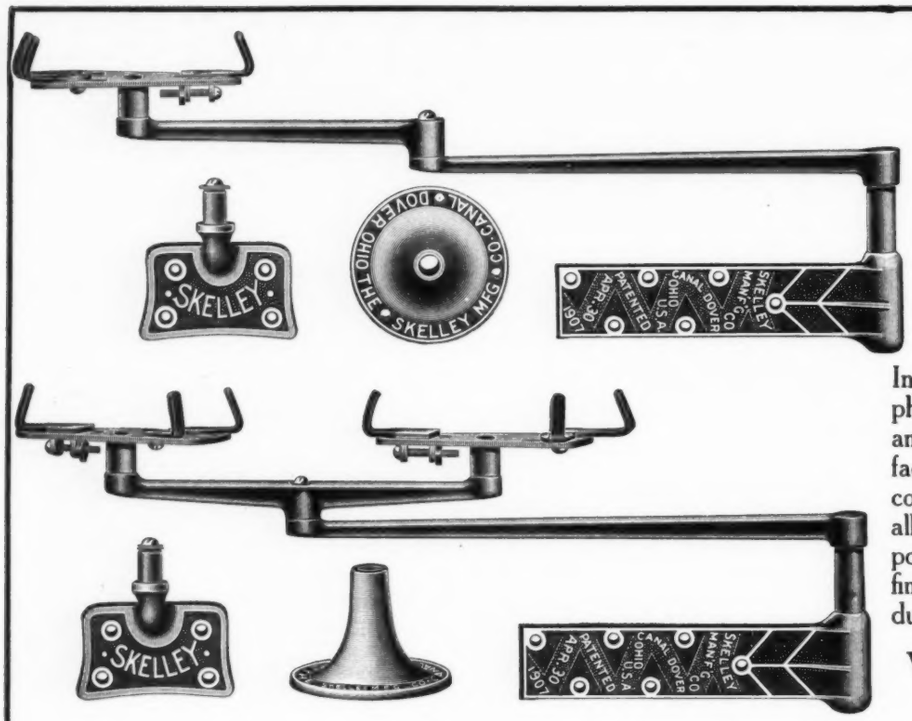
There are many other reasons why Monarch apparatus is gaining such favor for common battery work of all kinds. Give us specifications of your requirements and we will show you these reasons.

Write for a catalogue

Monarch Telephone Manufacturing Company

FACTORY AND GENERAL OFFFICE: WASHINGTON AND MORGAN STREETS, CHICAGO, ILLINOIS

BRANCH HOUSE: 177 MAIN STREET, DALLAS, TEXAS



The Improved Skelley Telephone Holders

For One or Two Telephones

In making a choice of Telephone Holders, action, finish and durability are important factors. The Skelley Holder combines the best features of all the others and has no bad points. Its action is perfect, in finish it is second to none. In durability it is easily first.

Write us today for circular and prices.

The Skelley Manufacturing Co.

Davis Avenue and Fifteenth Street **Canal Dover, Ohio**

Gould Telephone Storage Batteries

DESIGNED with a full understanding of the conditions of telephone service and built electrically and mechanically to meet these demands.

Gould Storage Battery Co.

MAIN OFFICES: 341-347 Fifth Ave., New York City
Works, Depew, N. Y.
Chicago—Rookery Building
SALES OFFICES: Boston—89 State Street
San Francisco—Monadnock Block
Toronto, Ont.—2 Bloor St., E.

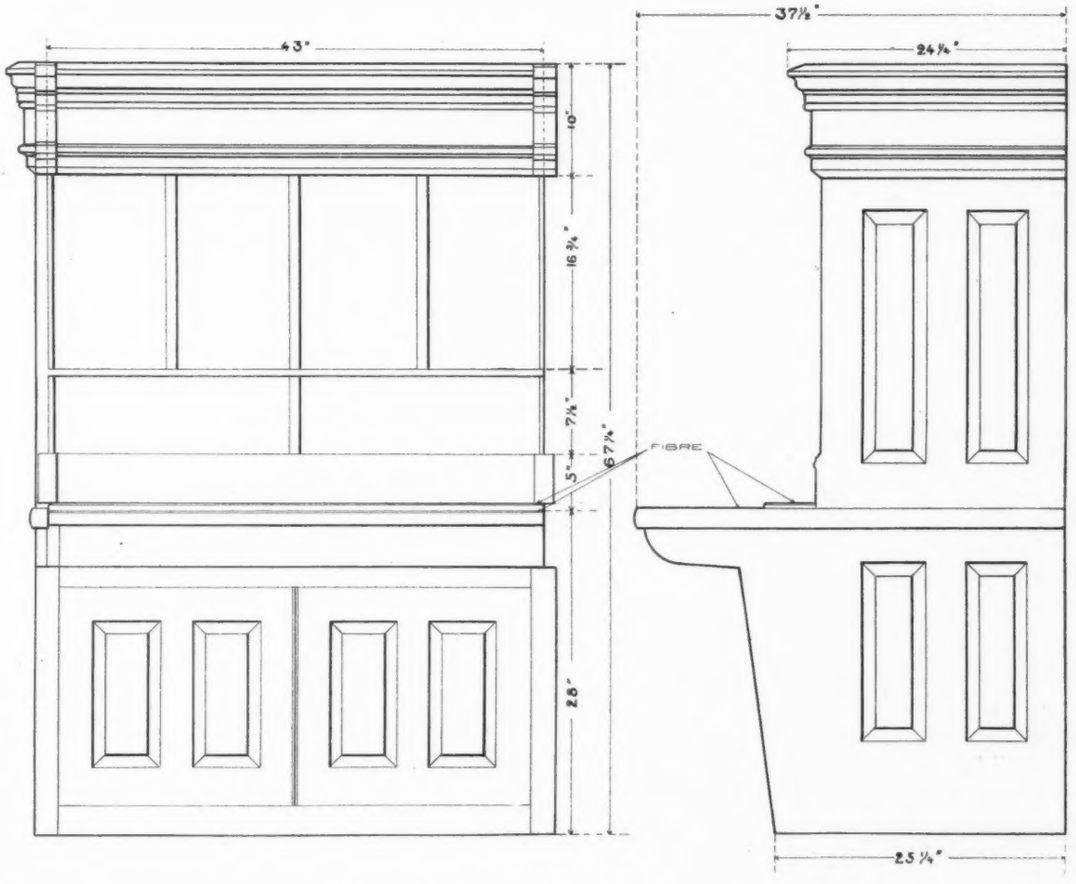
Ask for Catalog 256-J

The Westinghouse Machine Company

Storage Battery Department
East Pittsburg, Pa.

Notice the Dimensions

of an Ericsson 2800 Magneto or Common Battery Multiple Switchboard Section. They are a whole lot smaller than those you are used to see. Compare them with the dimensions of the Switchboard you now have.

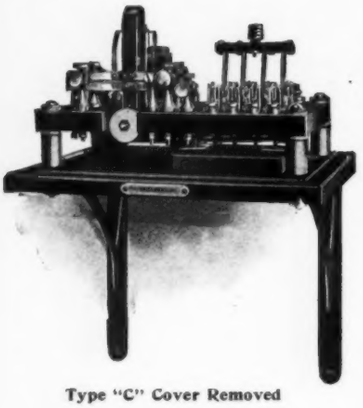


Your operator will tell you "what a difference a few feet make" in her reach.

Select wisely next time you're in the market for a Switchboard.

L. M. Ericsson Tel. Mfg. Co.

BUFFALO, N.Y.

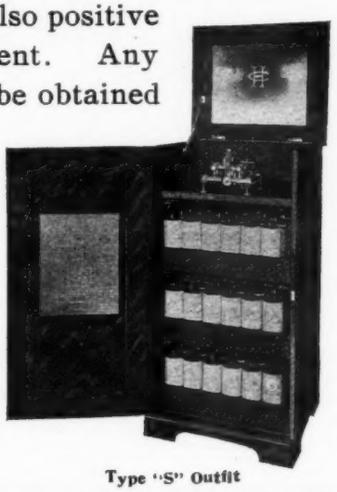


Type "C" Cover Removed

POLE CHANGER

IF you desire an inexpensive, reliable and satisfactory supply of ringing current, install an H-C pole changer. It converts the direct current from a battery of dry cells, into alternating, also positive and negative pulsating current. Any ringing voltage desired can be obtained by varying the number of dry cells.

It is made in two styles, namely, either with or without a cabinet to hold the batteries.



Type "S" Outfit

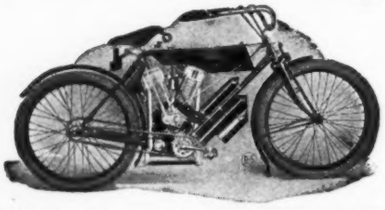
Write for Bulletin No. 209 and Prices

The Holtzer - Cabot Electric Co.

Home Office
BROOKLINE STATION
BOSTON, MASS.

Branch Office
395-397 DEARBORN ST.
CHICAGO, ILL.

"R.-S." Motorcycle



THE IDEAL MACHINE

For Telephone Companies, Line Men, Trouble Hunters, Collectors, Etc.

Can be fitted with R.-S. luggage carrier.

Powerful, simple, practical, economical, reliable.

The first and only real Mechanical Intake Valve Motorcycle made and marketed in the United States. Thousands in successful use. The only Motorcycle to climb Pike's Peak. Full of practical features and improvements.

The "R.-S." line comprises Single and Twin Cylinder machines, Tandems, Tricycles, Tri-Cars and Delivery Vans, and represents the most value as well as the most advanced motorcycle construction.

Hundreds of testimonials from every part of United States showing "R.-S." achievements in racing, record making, hill climbing, and endurance tests, sent *free* with complete illustrated catalogue, on request to Dept. A. T.

Reading Standard Company, Reading, Pa.

Makers: The Renowned Reading-Standard Bicycle

The efficiency of an operating force

is fully revealed by properly taken peg counts. Other equally valuable data is thus secured. The

Veeder Counter

makes it easy to learn such factors. The details are interesting. Write for our telephone booklet.

VEEDER MFG. CO.

11 Sargent Street, Hartford, Conn.

Manufacturers of
Cyclometers, Odometers, Tachometers, Tachodometers, Counters, and Fine Castings

We Carry for Immediate Shipment

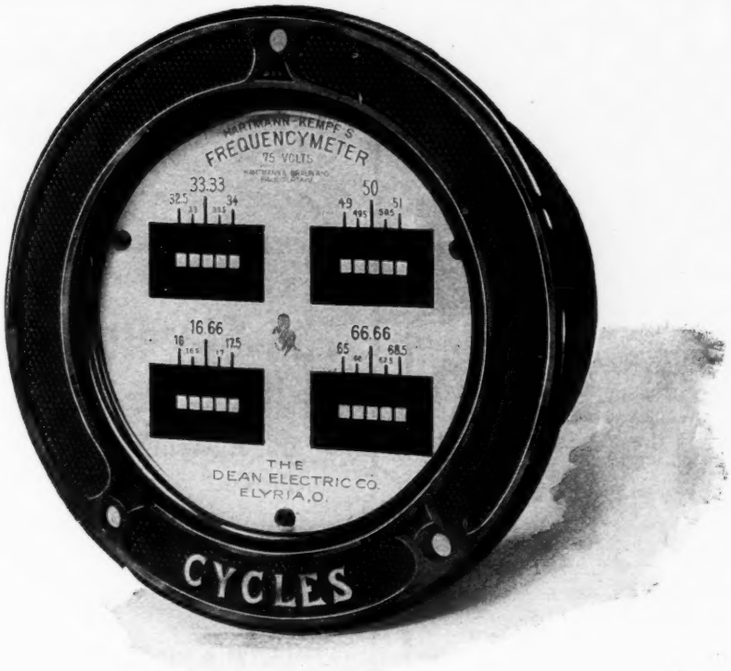
Capital High Speed Steel	Oil Tempered Wire
Capital High Speed Twist Drills	Music Wire
Eagle & Globe Tool and Die Steel	Tinned Wire
Solar Tool Steel	Cast Steel Binding Wire
Self Hardening Steel	Acme Resistance Wire
Forged Die Blocks	Coppered Bessemer Rods
Spring Steel Sheets	Cold Rolled Shafting
Crucible Cold Rolled Steel	Cold Drawn Screw Rods
Hardened and Tempered Strips	Cold Drawn Shapes
Drill Rods	Cold Drawn Norway Iron
Dental Octagons	Cold Rolled Flat Wire
Roller Bearing Rods	Coiled Springs

Send for Catalogue of Nash Salt Bath Tempering Furnace and our Steel Catalogue

GEO. NASH CO.

New York, 217 Pearl St. Chicago, 115 W. Washington St.

Cold Rolled Drawing and Stamping Steel



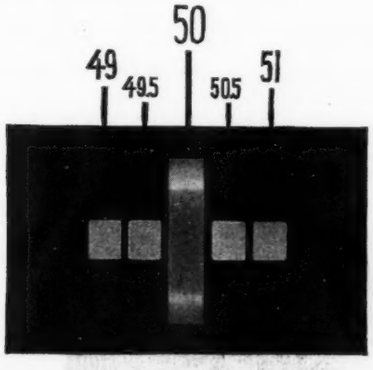
SCIENTIFIC SELECTION

¶ **The "Dean" Harmonic System** is still the only successful party line selective ringing apparatus in the world.

¶ **Absolutely no Failures** is the "Dean" record since the introduction of our Harmonic Converter (registered trade-mark) and our Harmonic telephones.

¶ **No working Installations** can be shown by some of the makers of imitating appliances—hence the long list of "Dean" successes is abundant proof of superiority.

¶ **Even the Slightest** uncertainty is now eliminated —"Dean" selective ringing is an exact science through the use of the



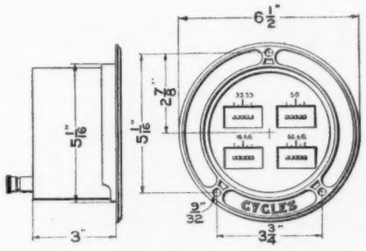
Hartmann-Kempf Frequency Meter.

¶ **With this Instrument** the number of cycles per second may be readily determined—the reading is instantaneous.

¶ **Plain Readings** are indicated by the reeds which vibrate as illustrated. Each of these reeds is a separate unit, even if one should be broken, the efficiency of the others would not be impaired.

¶ **Their Permanency** has been proven by three years' continuous vibration before the invention was marketed.

¶ **Hartmann-Braun, A. G.,** the manufacturers, of Frankfort a /M, Germany, have made us the American sales agents for this special instrument.



¶ **The Exact Dimensions** are shown in this drawing. The meter may be mounted in a portable case, or on a suitable mounting board above your power panel; or, it may be specified for any new "Dean" board.

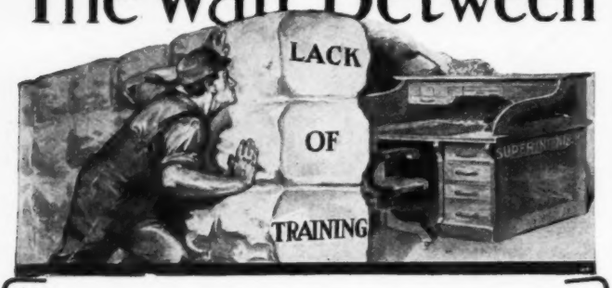
¶ Send for Dean Folder No. 15.

The Dean Electric Company

ELYRIA, OHIO, U. S. A.

San Francisco **Kansas City**

The Wall Between



There's a high stone wall between the untrained worker and the man with **special training**; between the daily bread wages and a good salary; between being "one of the **hands**" and "one of the **heads**" of a business.

Don't let that wall stop **you**. There's a way over it—**Learn more.**

You **must** have **training** now-a-days. You can't afford to guess—you must **know. Special training** fits you for big things, gives you the best chances, insures you a **lifetime** hold on a big well-paid job.

TELEPHONE WORKERS---LEARN MORE

Are you a Lineman, Instrument Man, Switchboard Man, Exchange Man, Trouble Man, Telephone Engineer, Electrician, Draftsman, Inventor, or Patent Lawyer, who wishes to qualify for a more lucrative position, and cannot do so for lack of training? If you are, let us help you. The American School of Correspondence will give you just the **special training** you need. Our courses in Telephone Practice, Telegraphy, Electrical Engineering and Drafting are written especially for **Home Study** by practical, technical men and are as complete and practical as they can be made. In addition to giving the most comprehensive instruction in the usual work, we lay particular stress on the course on the operation and construction of the **Automatic Telephone.**

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Please tell me how I can fit myself to earn a good salary in the line of work marked "X."

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—Heating and Ventilating Engineer	—Resident Engineer
—Civil Engineer	—Steam Engineer
—Architect	—Structural Draftsman
—Architectural Draftsman	—City Engineer
—Contractor and Builder	—Bridge Engineer
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Address .....

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Telephony, 10-10-'08.

DESIGNED BY PRACTICAL MEN

The Sky Rocket Arrester

Made for practical work, and they do it right. Their mission is to protect your lines from charges of excessive potential whether due to lightning or other causes, and they fulfill this mission invariably and infallibly.
Details, prices and references await your inquiry.

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Weston Standard Portable Direct Reading Voltmeter. Model 1.

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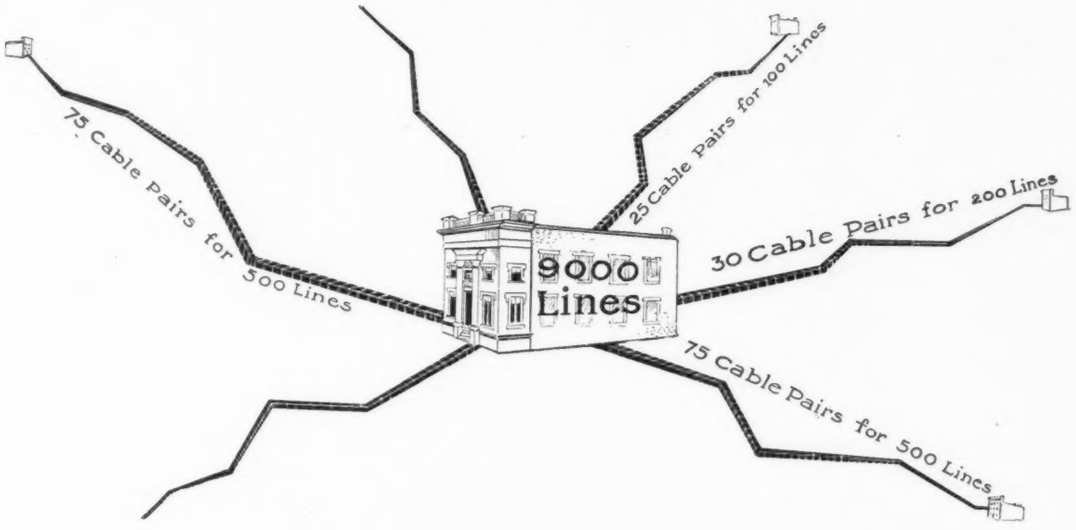
It's a Good Dividend Payer


75 Cable Pairs for 500 Lines
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9000 Lines
75 Cable Pairs for 500 Lines

WE will sell you a puppy and you can raise it yourself. To be more specific, we will help you to found and grow a Multi-Office Automatic Telephone System in your city that will save you so much cable that you can't keep it from paying dividends. With this system you put your switchboards where your subscribers are and don't go broke buying cable to bring your subscribers to one centrally located switchboard. For example—One company put a 500 line Automatic substation 3 miles from its central office and saved enough in cable and conduit to pay twice over for a lot and a handsome, brick residence and office building, combined, in which the equipment was installed. The cost of all labor employed in this office is $75.00 per month, $1.80 per line per annum. The service is just as good as in a single office system. Ask us to tell you more about it.

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Lewiston, Maine.
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Medford, Wisconsin.
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Wausau, Wisconsin.
Westerly, Rhode Island.
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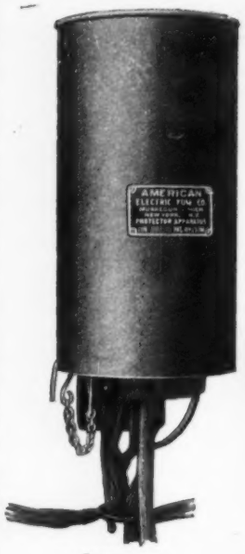
Automatic Electric Company

Van Buren & Morgan Streets

Chicago, U.S.A.

AMERICAN MICA FUSE CABLE TERMINALS

(NO POT HEAD REQUIRED)



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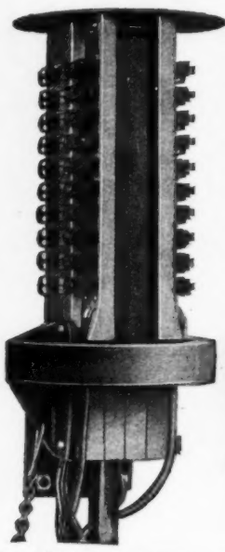
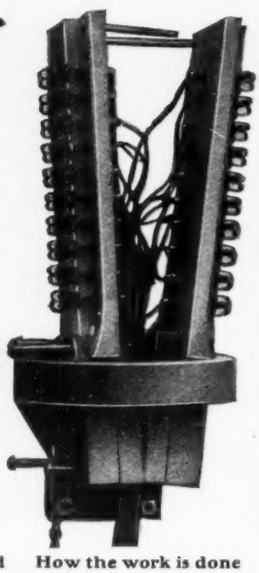


Type "F," Cover removed



How the work is done

On this page are shown three views of a new American Cable Terminal, known as type "F," and designed for any kind of cable, especially paper cable. It is not necessary to have a cable splicer to wipe a lead joint. It cuts out the expense of a self-soldering nozzle, and any man, even with no previous experience, can connect up his terminal. No pot head required.

Extra large carbons are furnished and the fuse protection is the American Patented Enclosed Mica Fuse, mounted in heavy brass Western Union clips of a new pattern, on hard maple strips made moisture proof by a special process.

All parts are held together by heavy bolts. To connect the cable you first loosen all bolts and raise the front and back slides. Then insert the cable between the clamping blocks at the bottom, first removing the lead sheath to the proper distance; then solder the cable wires to the clips as shown in last illustration.

Cork the cable at the bottom of the terminal, then tighten up the bolts and fill the center compartment with cable compound. This makes the safest pot head possible, made in the cheapest and quickest way.

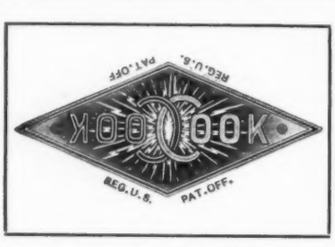
The fuses are mounted on $1\frac{1}{8}$ inch centers. A 10-pair terminal measures from top of can to lowest part of the casting, $14\frac{1}{16}$ inches. The can itself measures $12\frac{1}{16}$ inches in height by $6\frac{1}{4}$ inches in diameter.

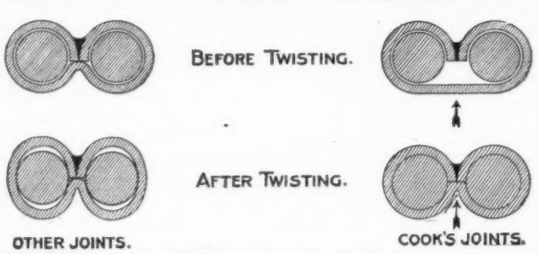
First illustration shows a 10-pair terminal with cover on; the second, a 10-pair terminal completely connected up but with cover removed; the last illustration shows the process of wiring up. The ground wire is soldered to a heavy ground plate and the bridle or jumper wires are attached to heavy screw binding post in the rear of the terminal.

The cable connects to the carbon side of the line and the jumper wires to the fuse side.

AMERICAN ELECTRIC FUSE CO.

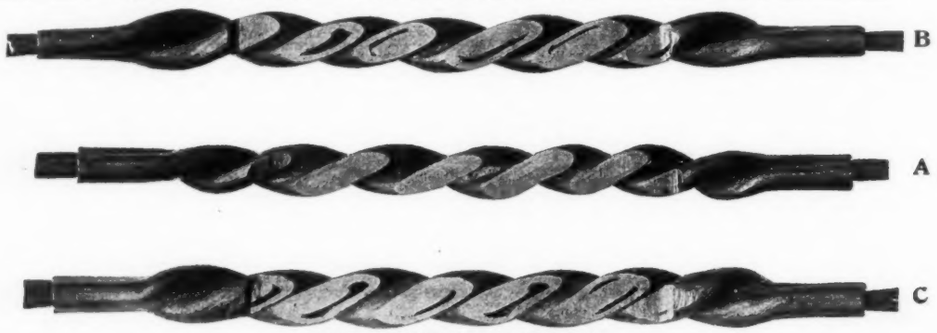
MUSKEGON, MICH. Highest Award, Worlds Fair, Saint Louis NEW YORK, N. Y.





Cook Self-Welding Wire Joint

In the Cook Joint the mere act of twisting draws the sleeve into the recess between the wires, stretching it absolutely tight around both wires, making a perfect self-weld.
A joint made with the COOK SELF-WELDING JOINT is stronger than the wire itself.
When a twisted joint is cut in two it is impossible to see where the metal in the joint ends and the wire begins.
Moisture or air cannot penetrate and corrode the wire and the joint. The Cook Self-Welding Wire Joint insures a permanently perfect connection.



WIRE JOINT COMPARISON

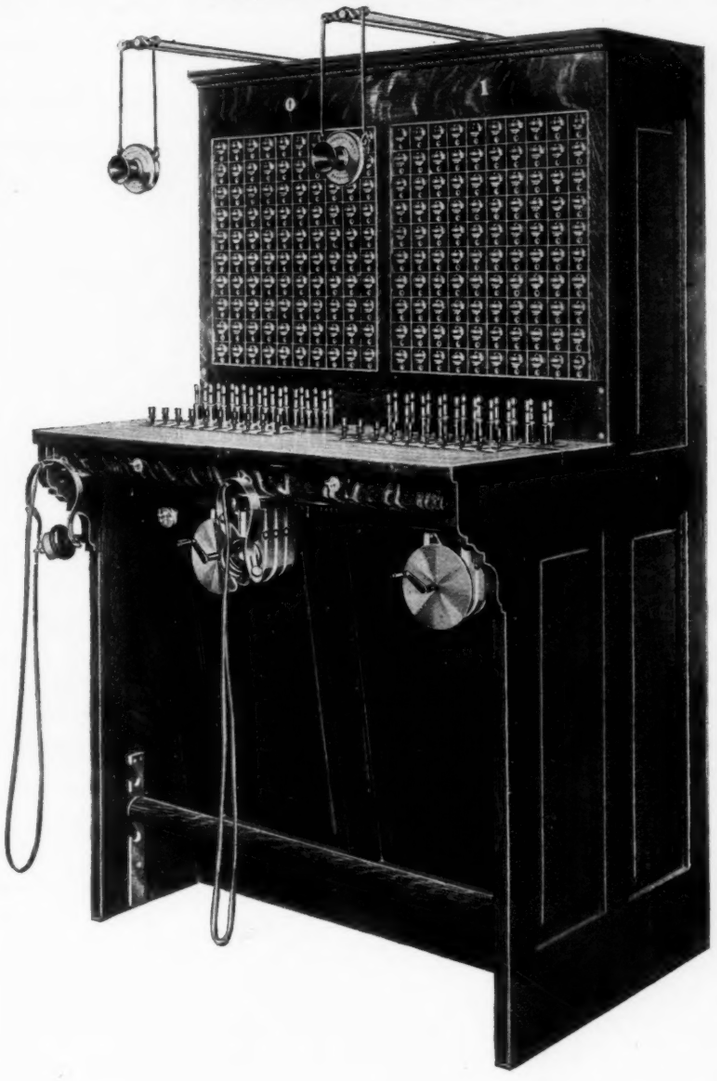
A—Cook No. 10 with 1 No. 10 and 1 No. 12 Wire. B and C—Competitor No. 10 Joint with 1 No. 10 and No. 12 Wire.

The Cook Joint will give perfect results as a combination joint, when the wires used are not more than two gauges apart. All sizes For Copper or Iron Wire, No. 18 to No. 0000

Frank B. Cook.

242 W. LAKE ST. CHICAGO, ILL.

200 Line Switchboard with 200 Unit Type Self-contained Drop and Jacks installed

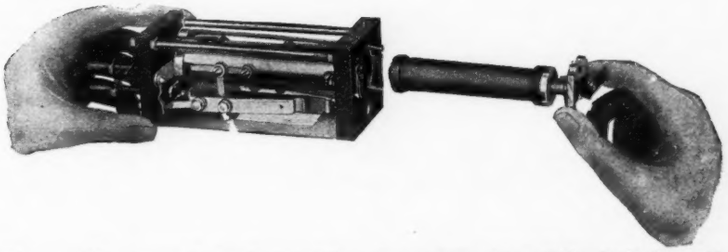


"Switch-Boards"

We can furnish switch-board of any desired capacity. You can have your cabinet wired to its full capacity, install number of drops you actually have use for and add additional ones from time to time as needed, one at a time if desired. You are not required to buy a bank of five or ten if only two or three are needed. Your money invested only in equipment that is earning something for you.

Our central office equipment has features of distinct advantage not found in other makes. A little investigation will prove this to you conclusively. You will favor yourself by investigating our apparatus, getting our specifications and prices before placing your order elsewhere. We solicit your inquiries and invite your critical investigation of our products.

Ask for complete
Specifications, Blue Prints
and
Illustrated Literature
Prices on Application



Type of Drop and Jack used in above Illustrated Switch-Board
Note Coil Removing Feature

Swedish-American Telephone Co.

Chicago

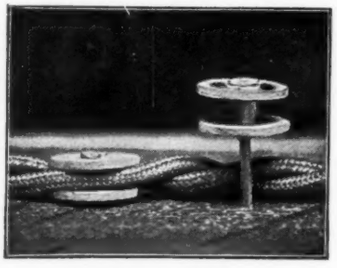
BRANCH, KANSAS CITY, MO.

Eureka Fibre Insulators

A NEW STYLE

"PRICES TO POINT, WHERE IT IS ECONOMY TO USE THEM"

The value is in the method that they are attached without injury to the wire

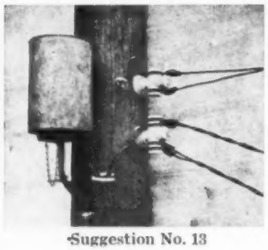


Made in Three Types 50, 60, 70 ¾", ⅞" and 1" long respectively

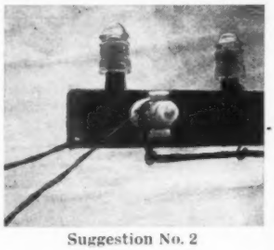
PRICES AND SAMPLES ON APPLICATION

Commercial Electrical Supply Co.

Fifteenth and Pine Streets ∴ ∴ ST. LOUIS, MO.



Suggestion No. 13



Suggestion No. 2

Universal Insulators

SOME ADVANTAGES:

A Separate Groove for Each Wire—Grooves for Any Direction—Universal—All Porcelain—Will Not Rot or Rust—Prevents Damage to Twisted Pair Wires—Reduces Maintenance.

Write for Descriptive Literature

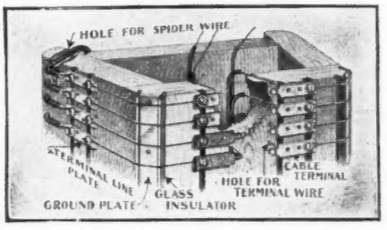
Universal Specialty Company

116 S. Seventh St. Terre Haute, Ind.

Suggestion No. 5

Suggestion No. 8

Fuse Prices Cut to Pieces



Fuse for this Terminal cost only **5** cents per 100.

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THE PROTECTIVE ELECTRICAL SUPPLY CO.
FORT WAYNE, IND.

The "EVERSTICK"

guy anchor is higher in efficiency and lower in price than any other guy anchor made. Will you have proof?

SPECIALTY SALES COMPANY
Cedar Rapids, Iowa

Good Goods

No. 322

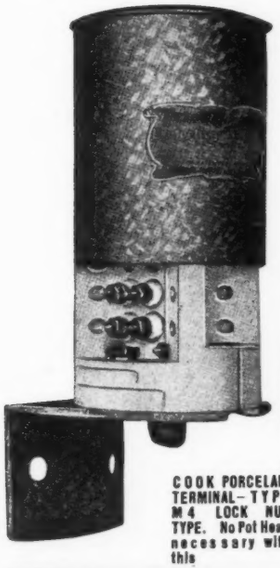
This desk set has the induction coil in base—can be removed by taking out one screw.

Transmitter and hook removed by taking out one screw, thus allowing the removal of the rubber tube exposing all working parts of hook.

All contacts knife switch type.

Sterling Electric Co., Lafayette, Ind.

COOK



COOK PORCELAIN TERMINAL—TYPE M 4 LOCK NUT TYPE. No Pot Head necessary with this

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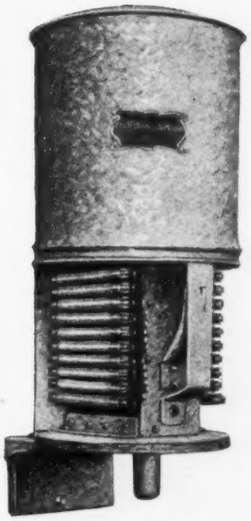
The favorite of every experienced telephone man who has investigated them.

Made for practical service by practical men,



TYPE S-6. COOK POLE CABLE TERMINAL

Write for circular of Cook Telephone Specialties.

Frank B. Cook

MANUFACTURER OF TELEPHONE PROTECTIVE APPARATUS

CHICAGO ILLINOIS

242 WEST LAKE STREET

Cook Specialties are money savers—every one.

Double the Life of Your Poles

TEN TIMES the Strength of Creosote

ANTISEPTINE
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The Perfect Cold, Hot Brush and Open Tank Timber Preserver

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THE MILLER SAFETY ANCHOR
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Perfect Non-Interfering Operation on Exchange Lines
as well as on the local system is only one of the reasons why you should use Connecticut Automatic Inter-communicating Telephones.
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MERIDEN, CONN.
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Diameter of Face, 2 1-2 in. Overall Diameter, 3 in.
D'Arsonval Type
Accurate; dead beat; fully guaranteed. Sent on 30 days' approval. Made in the following ranges: Ammeters, 1 100 ampere to 30 amperes. Voltmeters, 1 100 volt to 25 volts.
Price, $7.50 and upwards
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Magneto Equipment

The Sumter Telephone Manufacturing Company
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Get a Bulletin

Telephony.

THE AMERICAN TELEPHONE JOURNAL

Comprising Telephony, American Telephone Journal, Sound Waves, Telephone Magazine and The Telephone

Vol. XVI CHICAGO, SATURDAY, OCTOBER 10, 1908 No. 9

PUBLISHED EVERY SATURDAY BY THE

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Vol. 18	American Telephone Journal	No. 15
Vol. 16	Sound Waves	No. 9
Vol. 16	Telephony	No. 9

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CHICAGO, SATURDAY, OCTOBER 10, 1908

CONTENTS.

Editorial 345
Preventing Harmful Tree Trimming. By E. J. Harper..... 347
Comments on the 1907 Report of the A. T. & T. Co. By Gansey R. Johnson..... 350
Unlisted Service 352
History of the Automatic Telephone. By Arthur Bessey Smith 353
A Few Thoughts on the Advertising of a Public Service Corporation 355
Breslau, A Modern German Exchange. By Frank C. Perkins 356
The Cost of Rural Telephone Service. By M. D. Atwater.... 358
Inspecting Cables and Locating Faults. By Frank L. Clark.. 359
Elisha Gray's First Telephone Conversation..... 361
Austrian Telephone Development in 1906..... 362
The Telephone in the Courts. By A. H. McMillan..... 363
Practical Questions and Answers..... 364
Mayor of Marshalltown Signs Franchise for New Independent System 364
San Francisco Supervisors Refuse to Attack Home Telephone Franchise 364
Telephone News.....364, 365, 366, 367, 368
Telephone Patents 368, 369
In the Manufacturing Field.....370, 371, 372
Condensed News Reports.....373, 374

A Warm Breeze from Indiana.

The Central Union Telephone Company wants its monopoly back, and makes no bones of saying so. A quotation from a recent pamphlet, addressed "To the Public and to the Operators of Telephone Plants," reads like this:

"This company has for some time been convinced of the fact that the so-called "telephone problem" will never be permanently and satisfactorily settled until both the public and the telephone companies are properly taken care of; the public satisfied by complete service, efficient service, good service and just charges; the telephone company satisfied by fair treatment and reasonable profits. Upon this conviction the present business policy of this company is based."

Mr. L. N. Whitney, superintendent of the company's division which has its headquarters at Indianapolis, has been publicly asserted to have been the author of the following:

"Prior to 1894, the Central Union (Bell) interests being in possession of the controlling patents (in Indiana), and having made arrangements with the Western Union to keep out of the field, apparently felt there was nothing further to fear. They followed a business policy of apparently high rates and limited service, under foreign management with capital and other attributes that go with monopolistic ideas, preferring to do a small business at high prices rather than popularize the service at reasonable rates. The treatment of patrons, as might be expected from a corporation having such a complete monopoly, was arbitary in the extreme."

Mr. Whitney has never publicly denied the authorship of this—although in writing it he could lay no claim to originality, as it is one of those things which about everybody knows is true.

Now, this first quotation, from the latest pamphlet, coming on top of the statement of earlier conditions, furnishes, we fancy, just about as pretty an illustration of the public benefits resulting from competition as has ever been set forth in so small a space. What a complete change of attitude!

But, granting that the Central Union people think they mean what they say in that first quotation—how far can they go in actual accomplishment? The Central Union men look fairly human—like people who need some such spur as competition furnishes to set a standard, and keep them going at their best gaits. And, if they know that this touch of human nature makes it quite impossible for them to

attain perfection; and if they know that "the public" knows this—then why it not such a statement about the company's high ideals, not attained or approached, comparable to the cheapest kind of political clap-trap and mouth oratory?

While some people are trying to fool the public, others are going ahead with the work of educating them so that they will know good telephone service, and know good telephone investments, when they have them. And the men who follow up this line of work are the men who are going to put their systems on the right basis for the future.

Valuable New Work for National Telephone Convention.

A project which will be inaugurated at the forthcoming convention of the International Independent Telephone Association, to be held in Chicago, December 1, 2, and 3, promises to be a decided advance over the somewhat irregular efforts along the same line which have been hitherto exerted.

We refer to the plans for special meetings for the consideration of what may be properly called the technical features of the telephone business. It is expected that these meetings, which will be held concurrently with the regular convention, will be attended more particularly by the operating officers and department heads of the operating companies. Special problems relating to the business will be taken up and discussed on their merits.

Programs are being prepared with the object of having the conferences so arranged as to be of the utmost practical value to men working in special fields, such as, for example, managers, engineers, construction, maintenance and traffic men, contract agents, and possibly accountants. These meetings will undoubtedly be found to present exceedingly valuable substitutes for the discussions of chance-met telephone men on the same topics which have been of rather limited value to the general field, although highly interesting to individuals, during past conventions.

The preparation of the program for these meetings has been delegated by the officers of the Association to Mr. G. R. Johnston, of Columbus, Ohio, who is looking for suggestions about appropriate topics, and wishes to receive, in advance of the convention, contributions of practical papers from well posted men in all parts of the field. It is desired that contributions in duplicate should be mailed to Mr. Johnston at least as early as November 15, so that copies may be sent to other men who are particularly qualified to study them and discuss the subjects to which they relate.

Mr. Johnston can be relied upon to do a good deal more than his share of the work required to make this plan a success, but good, honest work is necessary on the part of all the men who are able to contribute papers. This is a project which deserves the most thorough support of every man who is interested in bringing out information on the best methods of conducting the various branches of the telephone business.

Forget Yourself!

A young man in applying for work with the maintenance department of a telephone company made the unusual request that he be given the hardest and most difficult cases. In hiring him, the manager promised to do this, adding that he would be likely to throw him into all the classes of work which the company handled. It was customary to assign a new man, even one with experience, to do work as the assistant of an inspector for a considerable time, until the company's methods could be learned, after which he would be allowed to work alone.

The first morning the new man was assigned to help an inspector install a telephone in a business house. After loading up with tools and supplies they started, the new man going at a brisk walk.

"Hold on," said the inspector, "not so fast. We don't do things that way here. I'll show you how we do it," and lighting his cigarette he strolled leisurely along as if he had all the time in the world. Passing a boot black's stand he remarked to the new man:

"Let's shine up. I haven't done it yet this morning," and generously paid for the blacking of both pairs of shoes.

Having arrived at the subscriber's premises the inspector carefully instructed the assistant in the methods used and insisted on good, careful work. When the installation was completed, he called for a test and O. K., and then received further orders. As they passed out to the street he said to his assistant:

"Jones, they say for us to come back to the office at once."

"All right, here we go," was the answer.

"Well, that means any time within an hour," said the inspector. "We've got time to have an ice cream soda apiece."

"At once means *now*," he said. "I'm going in."

Reluctantly the inspector consented and they returned to the office. On their arrival the assistant was greeted with:

"Jones, the A—B private line to X—— is noisy. You are to clear it, by special order of the manager. Catch the eleven o'clock train and go after it."

Eleven o'clock train, and it was now ten-thirty. No time to spare. First day and assigned to a trouble case alone! Thoughts like this flashed through the assistant's mind as he joyfully made his preparations, while the inspector stared and exclaimed:

"Well, he *is* shooting it into you, I guess!"

Jones made his train, found the line, and cleared the trouble. It proved to be his test case, showing what he could do, and gave him a standing with the company which he maintained.

There are many men who think more of their own pleasure and ease than of the welfare of the telephone business. Some of them are very good at work and can do it very thoroughly, but lack alertness to grasp the possibilities of the present. For a half hour's enjoyment, Jones might have lost his opportunity of demonstrating his ability. Some people mourn their lack of success and blame their fancied dearth of chances. They look at the successful man and see how he has risen from one opportunity to another. They imagine that if they had had the same opportunities they would have risen, too. It is false. There are plenty of chances around each of us. If we fail, it is because we do not use them. Some men do not see the opportunity. Others see it, but are too indolent to move quickly before the chance is gone.

The surest way to promote one's own interest is to put it aside and forget it for the good of the work.

Preventing Harmful Tree Trimming

By E. J. Harper

City Forester, Los Angeles, Cal.

As bidders for public patronage, telephone companies are well aware of the desirability of favoring the communities in which they operate by exercising every reasonable care to prevent their employees from inflicting needless damage upon the property of the municipality, or of its citizens. Such regard for the rights of others, or the unfortuante lack of it, perhaps attracts as much attention by its bearing upon the subject of the cultivation and preservation of shade trees as for any other cause. It is generally considered that nothing adds more to the beauty and health of a residential street than well-cared-for trees, and their presence also adds to the value of the property that they border. In all cities, however, there has been much crude and even criminal pruning of trees, due to ignorance, thoughtlessness or to a misguided spirit of commercialism. Private individuals and public utility companies alike have slashed the trees until they have lost all resemblance to natural shape and their beauty has been destroyed for all time.

Different varieties of trees demand different treatment in pruning, but there are certain principles which apply to all pruning. The first thing to be considered in trimming a tree is where to make the cut. The average person who has not made a study of pruning would sever the limb some 3 in. to 6 in. from the trunk with the result that the stub rots back to a certain point called the shoulder. It takes from five to six years for this stub to rot and drop out, and during all this time the tree has a festering sore in its side. A fungus growth almost invariably forms in the rotting wood, and spores from this eat into the heart of the tree. When the stub does drop out, the tree is probably marred for life, and if the spores of the fungus have gotten into the heart, the tree is doomed. These spores produce dry rot, for which disease there is no cure. The heart-wood and limb become wholly rotten, and there is no sound wood remaining, only a thin supporting shell of sap-wood. A wind storm, or the weight of the crown, causes the limb or tree to fall. An oak tree frequently becomes so diseased from such trimming that the bark is affected, breaks or fissures badly and falls away leaving bare patches. Fig. 1 shows clearly the result of this kind of pruning. The pepper tree shown is about 40 years old and should be a beautiful tree; but some time in the past six years a large limb was severed about 6 in. from the trunk and the tree is now doomed to an early death, because the limb was cut at the wrong place.

When a branch is to be cut off *there is but one correct place to make the cut.* Just above where the branch leaves the trunk there is usually a prominence called the shoulder. At this point nature always makes vigorous efforts to heal wounds, and here the cut should be made. Limbs should not be cut off with an ax, but with a saw. Inasmuch as there is a tendency for the wood and bark to split down, if care is not taken the bark will peal for a foot or more and make a bad wound which will retard the growth of the tree, if nothing worse happens. To avoid this, a cut should be made a foot or more from the trunk and then one can manage the stub without danger of the bark splitting. If it is impossible to use a saw, then a trained man should make the cut with an ax, striking up from under the limb. After the limbs have been removed, the wound should be treated by painting the scar with a coating of tar as an antiseptic. This will prevent the entrance of disease spores, and encourage the bark to grow and close the wound. Neglect here may not show immediate results, but a few years later the tree may be destroyed during a wind storm or manifest a permanent decline. The importance of painting the wound, therefore, cannot be too strongly emphasized. If these directions are followed, very large branches can be cut from trees without any serious evil resulting; if they are not followed, the cutting of a comparatively small limb may cause the untimely death of a fine tree.

The question of the time to prune is one of interest. In semi-tropic California trees may be pruned at any season, but a tree should never be trimmed when the sap starts into an active flow. At such a time the bark strips very easily and there is danger of making a large wound; besides the sap is thin and flows very freely; it is, therefore, hard to make paint stick to the wound and the tree bleeds to death. Heaviest pruning should be done in the early fall months, but there is more or less trimming going on all the time.

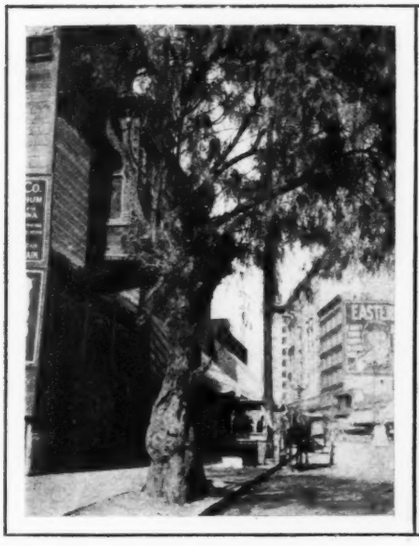


Fig. 1.—Result of Improper Pruning of a Pepper Tree.

Fig. 2.—The Camphor Tree Properly Pruned.

Fig. 3.—Improper Method of Trimming Trees.

The relation of the utility company to the street tree is a vital one and a most vexing problem to a city forester. In this strenuous age, telephonic communication and electric-light connections are imperative. If all the wires were placed in conduits the problem would be solved; but for many cities the day for conduit wiring is very far distant. Where a city has an adequate alley system the poles and wires can be placed there and not permitted on the streets, but where this is lacking the question of how to have good trees, telephonic communication and electric light becomes a serious problem. Civic organizations, however, have been formed in many cities and these protest more and more against tree butchery. In many cities the idea exists that public utility companies butcher trees without thought of their beauty or health, and in many instances this idea is well founded. The trimmers, mostly inexperienced men, have cut right and left to free the wires and have played havoc with the trees. In some cities this has been changed and there is a vast improvement in the pruning done by the companies. The latter have shown a disposition to meet the city forester's requirements and have employed experienced men to do the work. The Pacific Telephone & Telegraph Company, for instance, employs at Los Angeles a man who has had years of experience and who gives all of his time to the work of tree pruning. About 2000 permits have been issued to this company during the year, and in that time there have not been more than half a dozen complaints regarding the trimming. Before this office was created, the trees had great pie-shaped cuts made in the very heart of the crown, or the tops were so pruned that the trees looked as if an attempt were made to form a dance-hall floor on the tree top. Fig. 3 is an illustration of this class of trimming. The poles on the street are only 25 ft. high and over the tops runs a perfect network of wires, which, unfortunately, does not show in the photograph. The trees can never be shaped so long as such pruning of the tops is carried on. The pepper trees on the right were cut some years ago, pie-shaped, but have since filled the cut and the city forester has prevented further mutilation.

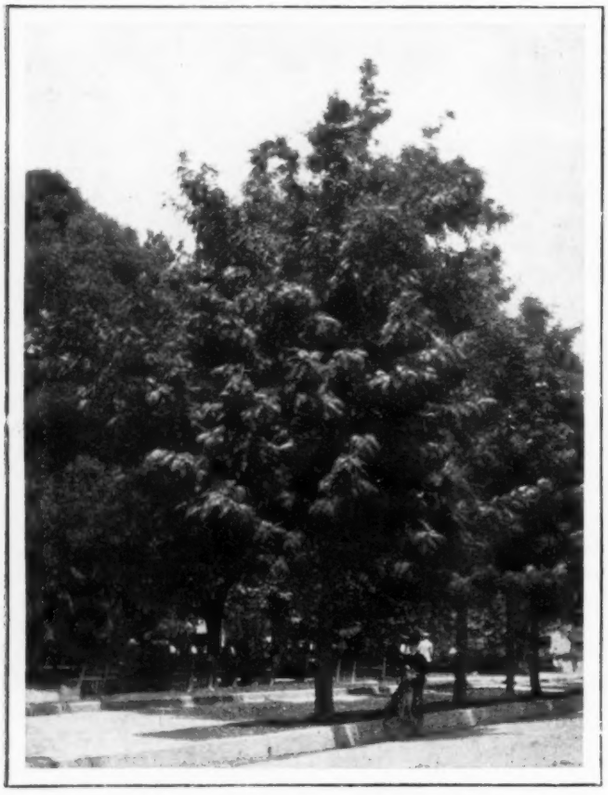


Fig. 4.—The Proper Pruning of the Grevilla Tree.

It is in the pruning of the heads of the street trees that the public utility companies are directly interested. The lower branches seldom worry them, and are often pruned by them, but because their poles are low they frequently ruin the tops in order to free their wires. It is dealing with this branch of pruning that one needs most to study the different varieties of trees. Almost every variety requires special individual treatment. All permits granted in Los Angeles have printed upon them in prominent type, "The trees must be trimmed so as to preserve their symmetry." This has caused the trimmers to give some attention to the nature of the tree and its growth, and has resulted in a marked improvement in the trimming over that of previous years. The grevillia requires a great deal of pruning. If allowed to grow naturally it soon becomes so top-heavy that its branches are broken badly by even light winds. Its wood is brittle and breaks with ease, and the bark has a tendency to strip down when thus broken. But with frequent trimming and by shaping the head in somewhat of an oval, the tree may be used for the street with satisfactory results. By keeping the head under 40 ft. and shaping it up a most beautiful street effect may be secured. Fig. 4 shows this tree prop-

Fig. 5.—Acacia Tree Ruined by Improper Pruning and Contact with Wires.

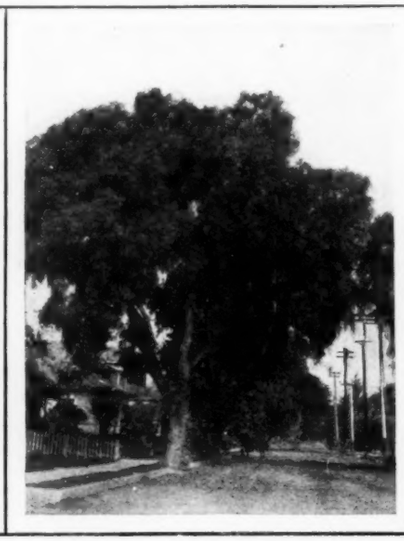


Fig. 6.—A Well Trimmed Pepper Tree with Crown 20 Feet Above Sidewalk.

Fig. 7.—Trees Ruined by Having Tops Cut Each Year.

erly pruned. Fig. 8 shows the same variety of tree butchered by inexperienced trimmers. In the latter case the only idea was the freeing of the wires, and it will take years for these trees to regain the beauty that was destroyed in a few minutes by ignorant men.

The tops of trees should be pruned from ladders, or derricks on wagons. The trimmer should never climb the tree. Some trimmers for utility companies use spurs on their boots for climbing the trees and reaching the objectionable branch. A number of street trees have been lost from this cause. The spurs make wounds which cause bleeding, and many trees never recover from them. Then disease spores enter through these wounds, and though the wounds heal the damage is done and the tree never recovers. Moreover, the symmetry of the tree cannot be studied from amid its branches.

The black acacia should be permitted to send its leaders up after one or two cuttings. It will make a much more beautiful tree if this is done and in time will reach the height of 50 ft. or 60 ft. Of course, it is in the way of the wires; but, by using poles 40 ft. high and keeping the tops just under the wires, fairly good trees are secured. The effect, however, is nothing like as good as when the tree is permitted to grow to its natural height. The artificiality of the flat top is not pleasing as one looks down the street. The desired effect might be secured by placing the wires in cables. Poles could then be lowered, if desired, by the companies.

The beauty of the pepper, like the elm, lies in its spreading top. This tree should never be trimmed in an artificial shape, nor should its crown be circumscribed. But as its crown is never so compact as the acacia, for instance, its grace is not marred by cutting out some of its inner branches. So the utility companies by the use of the "ring construction" may run their wires through this tree and secure free passage without destroying its beauty. Of course, the use of cable is preferable, but the ring construction may be used with careful pruning of the inner branches. The crown of this tree should never be formed lower than 15 ft. or 20 ft. above the sidewalk. Fig. 6 shows the tree well trimmed with the crown some 20 ft. above the walk. The crown should be permitted to grow as tall as it will and to spread as far as it likes.

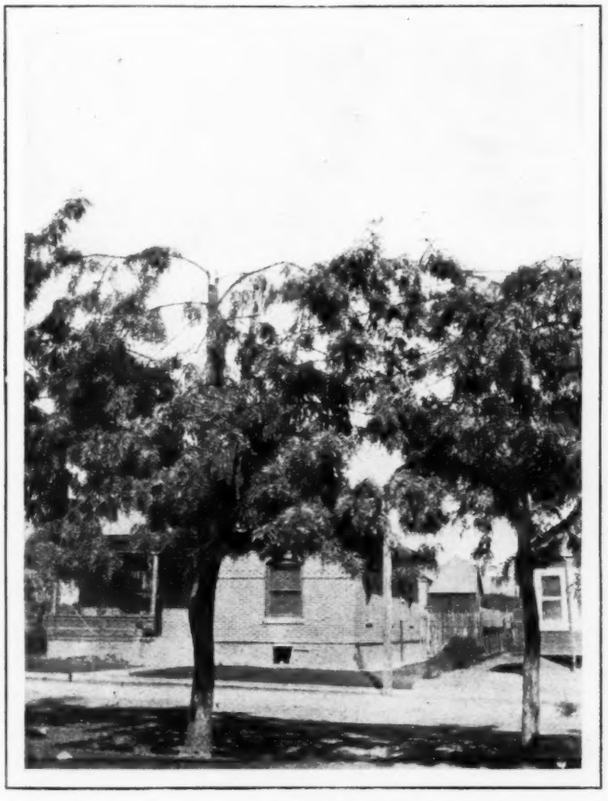


Fig. 8.—The Grevilla Tree Butchered by Inexperienced Trimmers.

The sterculia is a California tree that grows well in any deep soil and is excellent for planting in narrow parkways, as it has no large lateral roots. This tree grows conical in shape, and should never have its head cut as it never recovers from such trimming. Poles 40 ft. high will keep the wires out of the way of this tree for a number of years, and then the cable or the "ring construction" will save the tree.

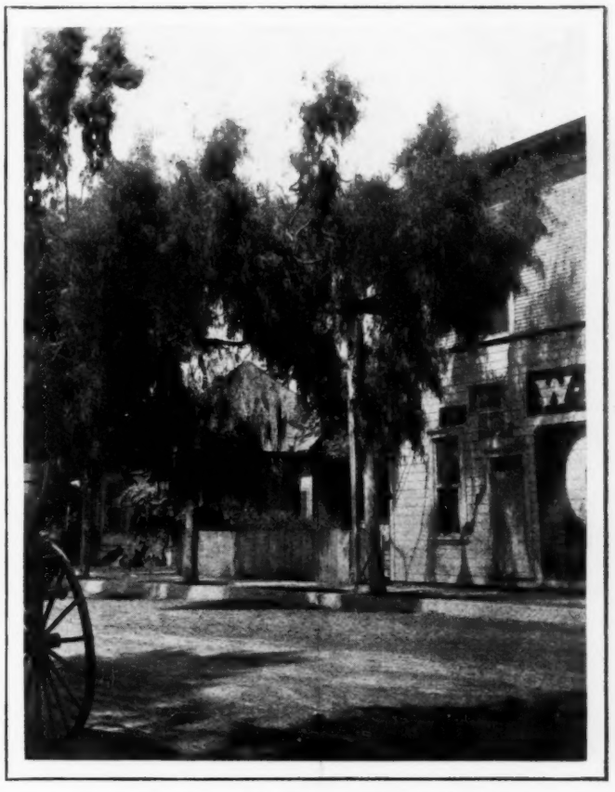


Fig. 9.—Trees Spoiled by Annual Trimming.

The camphor tree is easily pruned. In the spring when its young growth is on there is no more beautiful tree. Fig. 2 shows the camphor properly pruned. The trees are 12 years old and are 30 ft. high. The poles are here 40 ft. high so that the trees have not yet come into contact with the wires. In time they will grow very tall and have a large spread, but, as the top becomes more open as they grow older, the crown may be pierced by the wires without destroying its beauty. Of course, the ring construction or the cable will have to be used. The practice of certain utility companies of putting cross-arms on their poles some 6 ft. long and then stringing them with as many wires as the arms will carry has resulted in much harm. No tree can send its leaders through such a network of wires unharmed, and the wires must of necessity suffer from the constant chafing of the branches. To keep the branches trimmed below this network of wires is to make a monstrosity of a tree. Figs. 7 and 9 show the result of such practice. In each case the poles are not over 25 ft. high and on the cross-arms there are some 18 or 20 wires. Each year the tops of these trees have been cut off just below the wires, so that now, though this has been forbidden, the trees cannot recover from such pruning for several years, if ever. The companies, of course, wish to save expense, but it is questionable whether one should be permitted to destroy or mar a street tree to save a few dollars. Fig. 5 shows an acacia tree ruined by such pruning.

Comments on the 1907 Report of the A. T. & T. Co.*

By Gansey R. Johnston

General Manager, The Columbus Citizens Telephone Company.

The 1907 annual report of the directors of the American Telephone & Telegraph Company, which is the controlling company of the Bell telephone interests, contains remarks with reference to Independent telephone companies, their promotion and competition, and with reference to public control. Certain extracts from the report are reproduced below. If these remarks have any bearing upon the future of the business, they display the belief of the Bell interests that the monopolistic condition of the telephone business is the proper one, and that the purpose of those interests is to re-establish such monopoly—presumably with themselves in power, although subject possibly to public control. Acquaintance with the business since its original opening to competition after the expiration of the Bell patents in 1894 brings many evidences of their continued purpose in this direction, and of the recent strengthening of that purpose as the competition has become more and more effective.

The object of this paper is to show that the competitive condition of the telephone industry is now, and so far as we can see into the future, the proper condition, and that no more of municipal, state, or other form of public control is needed than is necessary to prevent fraud or exorbitant charges.

Extracts from the A. T. & T. Report.

Promotion and Competition—Independent Companies.

The unusual production and prices, during the past few years, of those commodities which this country sells to the whole world, with accompanying very general distribution of wealth, resulted in an almost phenomenal financial and industrial activity, stimulating new enterprises and promotions of all kinds, among them independent telephone companies.

The exaggerated stories of the fortunes made by original telephone investors, together with misleading statement of probable profits, made it possible to launch many of these companies pledged to *low rates for exchange service and high dividends to investors.* At these low rates, with "maintenance" and "reconstruction" expenses either intentionally or ignorantly disregarded, these companies for a time appeared prosperous.

The result has been unfortunate in nearly every case. The promises and pledges as to rates and profits, made as an excuse for their coming, as a basis for their franchise, and as an incentive to attract capital, are now admitted to be impossible. Most, if not all, of these companies, which have had an existence long enough to force attention to the items of 'maintenance" or "reconstruction," are now asking for increased rates, and to be absolved from onerous conditions freely accepted and assumed at the beginning. Reorganizations are now in progress.

It would seem, as a whole, that the gain of the public through competition based on low rates has not compensated for the loss of capital invested in these enterprises.

During this period of strife and rush for development and extension, many subscribers were connected to exchange systems with little or no benefit to themselves or advantage to others, and much was done that under ordinary conditions would not have been done.

Competition.

The value of any exchange system is measured by the number of the members of any community that are connected with it. If there are two systems, neither of them serving all, important users must be connected with both systems. Connection with only one is of but partial value and cannot be satisfactory. Two exchange systems in the same community, each serving the same members, cannot be conceived of as a permanency, nor can the service in either be furnished at any material reduction because of the competition, if return on investment and proper maintenance are taken into account. Duplication of plant is a waste to the investor. Duplication of charges is a waste to the user.

The advantages claimed for competition are lower rates and improved service. Exhaustive competition may temporarily produce either or both of these results, but, as before stated, this temporary gain is purchased by an excessive waste. Duplication of plant and operation cannot produce either result without exhaustive competition. Given the same management, the public must pay double rates for service, to meet double charges, on double capital, double operating expenses and double maintenance. In most cases of proposed competition an examination of the prospectus will show that, by some process, it is expected to make good a capitalization equal to at least two or three times the actual cost of the construction. The only benefits are to the promoter.

Public Control.

It is contended that if there is to be no competition, there should be public control.

It is not believed that there is any serious objection to such control, provided it is independent, intelligent, considerate, thorough and just, recognizing, as does the Interstate Commerce Commission in its report recently issued, that capital is entitled to its fair return, and good management or enterprise to its reward.

Independent Companies Not So Black As Painted.

In this writing, I will not undertake to gather and publish data refuting the insinuations and allegations of improper promotion (as distinguished from "good management or enterprise") of Independent telephone companies on any considerable scale. The A. T. & T. general statements in the first paragraph quoted may be met by general denial. The observation of those in the business and of those who have enjoyed their service is to the effect that Independent telephone companies, while not uniquely free from inflated values, flimsy construction, and sales to unwary investors, have not been burdened by these to any notable degree. There has been no general admission by Independent telephone companies of non-excuse for being.

One Bell Claim Inconsistent With the Purpose of its Argument.

It is suggested that the promoter in most cases obtains benefits from expecting to make good a capitalization equal to at least two or three times the actual cost of construction. *Fraudulent* promotion finds no more defenders among Independent than among Bell telephone men. If any Independent telephone capitalization is good—and the Bell people have never shown that more Independent than Bell capitalization has been bad—and if it is made good in these proportions by rates lower than Bell rates, what is the inference concerning those Bell rates now and before reduction, or what becomes of the "disregarded maintenance" argument? If a company can make good a capitalization three times the value of its physical plant it can surely make that plant good.

*Abstract from a pamphlet published by the International Independent Telephone Association.

Why Rates Increase.

That some of the many Independent telephone companies, after years of operation, have sought to increase their rates, and have even admitted an increase in rates to be necessary to their solvency, is not evidence that the rates at first were too low or the early years on a shaky financial foundation. Causes have arisen requiring a higher level of charges than were necessary when the plants were installed. Among these have been higher prices of material and labor, losses due to abandonment of equipment rendered obsolete by the progress of invention, and the increased cost growing out of the multiplication of telephones.

As lines are added to a telephone plant, the cost of construction, maintenance and operation of each new and of each old line tends to increase because of the addition. The construction cost of the new lines averages greater because the average length of line increases with the growth of the plant. The construction cost of the switchboard connections for both the old and the new lines increases because facilities must be provided at the switchboard to connect each line, old and new, with every other line, as well as extra facilities for the additional traffic. The unit of operation cost increases because, as new connections are provided, there is additional use of each line. For example, each subscriber on a 2000-line plant uses his line for such business as he has occasion to do with those two thousand, and for the entire subscription list (without taking into account more than one person for each line) the possible demand for connections is limited to the square of 2000 less 2000, or 3,988,000. If the plant is doubled, each of the original two thousand has his original outgoing and incoming calls plus what he has with the additional subscribers, and in like manner do the new ones have more than did the old. The limit of demand in this case on the same basis is measured by the square of 4000 less 4000, or 15,996,000. If the plant is trebled, then the limit of the demand is measured by a number nine times the first one taken. If the number of persons using each telephone should be taken into account, the increase would be much more rapid than indicated. While the actual demand never approaches the possible demand, it is certain to increase in greater ratio than by simple addition. The additional traffic means more work for operators and consequently more operators proportionately, and greater wear and consequently a higher maintenance charge for each line. As the size of the plant grows, the operators work under increasing physical difficulties, and with still greater growth the line connections get beyond the operator's length of arm, so that the separation of switchboards is necessary. The average maintenance charge is increased, not only by the wear, but by the existence of the additional central office equipment and the longer length of lines to be kept in repair and ultimately replaced. On a very large plant certain traffic, trunking and transmission difficulties require large expenditures in their overcoming. Not only does the cost increase as outlined, but also does the value to the user increase. If the telephone charge were based on a unit of use, as in the ordinary business, then probably the telephone business would be more analagous to the ordinary business; although even such charge would not afford relief from the extra elements of construction and maintenance costs. Within certain limits the public gains more from the larger number of connections than it loses by paying an increased charge for line rental, if indeed the charge is not left stationary. The existence of limits to this enhanced value will be made the subject of further discussion.

Columbus as an Illustration.

Most of my illustrations will be chosen from the city of Columbus, Ohio, having a population within the exchange district of approximately 180,000. The Columbus telephone history and present situation are fairly typical. The Citizens Telephone Company began agitation for a franchise late in 1898, when the Central Union (Bell) Telephone Company had less than 1900 telephones, with rates near the business district as high as $96 a year for business telephones and $48 for residence telephones, and with additional charges for distance beyond one mile or more from the exchange. The rates throughout the city today are respectively $54 and $27 a year for Bell main line bnsiness and residence telephones. By the time the Citizens plant was placed into paid operation in August, 1900, the Bell company had probably 4000 telephones. Within a year the Citizens Company had 5400. This was more than there had been reason to expect from the history of the business. At the present time each company has in the neighborhood of 12,000. Within this period the Citizens Company has abandoned its original switchboard, with a capacity of 5200 lines, because of its having been outgrown as well as fallen behind the progress of invention. The Bell company has recently abandoned its switchboard which was in operation in 1899. The Citizens Company's expenses showed a gradual increase per line as the plant grew. At the close of 1906 there were 7300 main-line telephones. The directors then considered an increase in the business rate of $6 a year and in the residence rate of $3 a year, besides the reduction of certain minor rates, and the installation of a two-party-line service at $34 and $18 a year. The reasons for this consideration were found not in any need for correcting past mistakes, but in the need of greater revenue to offset the increased expense per line and the then high cost level of copper and other material and of labor, and, of more importance, to take care of the prospective development at the increasing cost. In the judgment of the directors, there was and is greater public need for further development than for the continuance of the low rates. However, since that time there has been a saving to the company through the use of new automatic telephone equipment and the invention of cheaper means of adding to the plant. Accordingly the rates have been allowed to remain at the lower level.

Business Telephones at $40 a Year.

Average number in service	Telephones		Yearly Saving		Years		Total Savings
Aug. 1 to Dec. 1, 1900	1968	×	$32	×	5/12	=	$ 26,240
Years 1901, 1902, 1903, 1904	2300	×	32	×	4	=	294,400
Year 1905	2456	×	14		1	=	34,384
Year 1906	2849	×	14		1	=	39,886
Total							$394,910
Year 1907	2994	×	14		1	=	41,916
Total							$436,826

Residence Telephones at $24 a Year.

Aug. 1 to Dec. 31, 1900	1616	×	$18	×	5/12	=	$ 12,120
Years 1901, 1902, 1903, 1904	2530	×	$18	×	5/12	=	$ 12,120
Year 1905	2455	×	3		1	=	7,365
Year 1906	3992	×	3		1	=	11,976
Total							$213,621
Year 1907	4620	×	3		1	=	13,860
Total							$227,481
Saving on both business and residence telephones to close of 1906							608,531
To close of 1907							664,307

Table Showing Public Savings from Low Rate for Telephone Service.

Now the question is whether such changes in rates as were considered by the Citizens Company, and such as have been proposed and carried through by other Independent companies, are *unfortunate* to the extent implied in the report of the American Telephone and Telegraph Company. The public for more than six years had enjoyed the lower rates of the Citizens Company;

and for these rates, it is fair to say, had received quite as many benefits as could have come from Bell telephones.

Public Savings from Low Rates.

A table of the public saving is given elsewhere. The Central Union rates varied somewhat with grade of service and distance from the exchange, and were not uniformly maintained for all users, but it seems more than fair, for the purpose of comparison with the single-line, copper-metallic circuit, granular-carbon transmitter service of the Citizens Company, at $40 and $24 within the city limits, to use the $72 and $42 rates of the Bell company until their general reduction to $54 and $27 in 1905.

From the table it appears that if the competing telephone company had never come into existence and those persons who took the competing service had taken the service of the Bell company at the prices it was then charging on its exchange of 1900 telephones, they would have paid to the Bell company $514,920 before that company reduced its rates. Since the reduction of the rates (which did not take effect with the beginning of 1905, although the table shows it for the whole year), there has been an additional saving, figured on the same basis, of $149,387. It seems fair to assume that the primary cause of the reduction was the competition, and that in the absence of the competition the rates would have been increased rather than reduced, inasmuch as the Bell plant has increased sixfold.

Their Bearing on "Reconstruction."

On the basis of the present main-line subscribers of the Citizens Company, the difference between the rates now charged by the two companies means a saving to the subscribers of the Citizens Company of about $60,000 a year. This sum, invested at 6 per cent, would amount in 19 years to $2,150,000, which is the present entire outstanding capitalization of the Citizens Company. In other words, if the Citizens Company would begin now to charge its present subscribers the rates charged by the Bell company and would invest the increase in its revenue at 6 per cent, it would have all the income it now has for maintence, operation, general expenses, taxes, interest, dividends, and surplus, and in addition thereto, in the course of 19 years, would accumulate sufficient money to retire every dollar of its invested capital.

If the directors of the Citizens Company have erred in their rates to the extent implied by the Bell reports, then they erred by the full amount of a generous "maintenance" or "reconstruction" account on top of all that they have applied to such an account. Something other than "maintenance" or "reconstruction," to all appearances, is needed to justify the original and present Columbus Bell rates.

Such Savings Equal to Duplication of Charges.

This amount, $60,000, is about equal to the amount paid the Citizens Company for telephones duplicating Bell telephones. The community, as a whole, then, is suffering no loss from the existence of the Citizens service at its lower rates, if it be admitted that the Citizens service is worth the Bell prices. It is not necessary for this comparison to admit that the second telephone in an establishment is worth anything at all.

(To be Continued.)

Unlisted Service.

It is well known that many very active business men, to save themselves from the annoyances of promiscuous calls from the public while at home, do not have the numbers of their residence telephones listed in the directory. The importance to the company of having these lines appropriately covered by the operating room records is well illustrated by the following anecdote:

In a large southern city the state agent of one of the important life insurance companies, for some reason or other best known to himself, had no telephone in his residence other than an "outward domestic." Upon the death of the state agent, whom we shall call Major Jones, the company sent its vice-president to represent it at the funeral. Upon the arrival of the vice-president his first act was to attempt to telephone to the residence of Major Jones, but not finding the residence listed in the directory, he called "Information" and was informed that Major Jones had no residence telephone.

Upon receiving this advice the vice-president became irate, and called the general manager of the telephone company. After telling his name and position, he told the general manager that he had just been told by the chief operator that there was no telephone in the residence of Major Jones, and that he was positive that there was one there, and wanted to know why he could not get connection with it. The general manager advised him that he was not in touch with the intimate details of the operating department, but that he would take the trouble to look into the matter.

The general manager communicated with the operating department and found that the information given to the vice-president was correct, whereupon he telephoned the vice-president and verified the information originally given. This information seemed to make the insurance man more irate than ever before and, in very uncomplimentary terms he told the general manager that he did not know what he was talking about, that he had from month to month for several years past personally passed vouchers for the rental of a telephone in Major Jones' residence, and, furthermore, that he did not like the way the telephone company did business.

By this time the general manager's temperature had risen, and as a reply he told the vice-president that he held a life policy with his company and that he did not like the way that his insurance company was handling its business. As this happened about the time that the big investigation was in full force it is needless to say that the insurance man hung up.

This instance is merely a side light to show the importance of maintaining in the operating room a record of all subscribers' stations whether they receive inward service or not. As likely as not the insurance man went away with the idea that the telephone business in the South was wholly bad, and that the treatment which the public received from the officials was little better.

It might be explained that the "Outward domestic" service, more commonly known among telephone men as "Kitchen service," was intended to give outward service only, by which cooks and butlers might order supplies, etc. Any number of sets up to 25 were bridged on one pair of wires which terminated in an answering jack at the central office. As the name implies, this service was outward from the station, and as no inward service was to be given, these stations were not listed in the directory.

A New Type of Limited Service.

The following is from the New York *Tribune*:

"A girl whose engagements are many and who is therefore out a good deal has established a telephone hour. In this way her friends are always sure of catching her on the wire, and she comes in for many unexpected good times that otherwise might be missed. Until she did this it was almost impossible to get her. Now if she is not at home at the telephone time she calls up the house and tells her maid where she may be reached. The arrangement works to a charm, she says, and nothing would induce her to go back to the haphazard fashion of any and no time."

See the possibilities of producing a new afternoon peak in this! Once it starts to be a fashion it may bear watching.

History of the Automatic Telephone

By Arthur Bessey Smith

Assistant Professor in Telephone Engineering, Purdue University.

The New Bedford board was installed by Mr. T. G. Martin, work beginning in October and being completed in December, 1900.

In May, 1901, the plaster of Paris bank was discontinued. Though it had served better than the electrose bank, it was still far from perfect. The next move was a bank built up of brass terminals separated by layers of paper. The use of paper

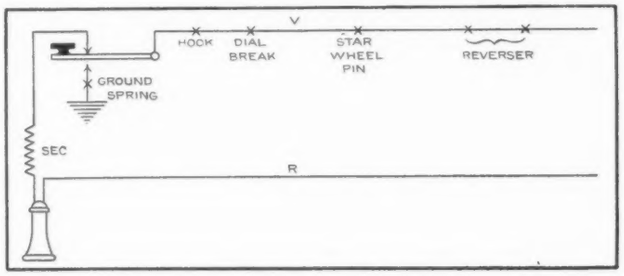


Fig. 62.—Wiring Diagram of Substation Ringing Key, Automatic Exchange in Fall River, Mass.

soon gave way to hard fiber, specially treated to prevent the absorption of moisture.

In the spring of 1901 the present Automatic Electric Company was organized to carry on the business of making and selling automatic telephone apparatus. The Strowger Automatic Telephone Exchange retired from activity, merely holding the patents under which the Automatic Electric Company operated. The personnel of the latter was as follows:

President, C. D. Simpson; vice-president and general manager, J. Harris; secretary and treasurer, A. G. Wheeler, Jr.; general superintendent, A. E. Keith; engineers, A. E. Keith, T. G. Martin, John Erickson, Charles J. Erickson, E. C. Dickenson.

The new organization was not encumbered with the business which had harassed the older concern, and started with a fair chance for success.

In June, 1901, an automatic switchboard was installed at Fall River, Mass. It was of the 10,000-line type and followed quite closely the lines of the New Bedford board. But there were certain distinct improvements which will be mentioned in

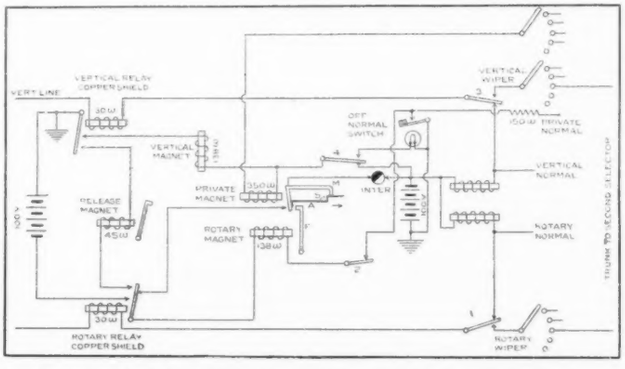


Fig. 63.—First Selector Switch, Fall River Exchange.

detail, as they made Fall River the dating point of the really modern system.

The substation sender had the same mechanism for sending signals, and operated on the same code with regard to the vertical and rotary lines, namely, the first three digits consisted of a series of impulses on the vertical followed by one on the rotary line. The last digit was reversed, the series of impulses going in over the rotary and ending with one on the vertical line.

The system of ringing was improved so that it required the grounding of only the vertical line to operate the ringing relay, and no resistance was needed. The wiring of the ringing key is shown in Fig. 62, the other substation details being omitted, since they are exactly like the New Bedford system previously described.

The first selector is shown in Fig. 63, and differs in several points from the New Bedford switch. In the Fall River first selector here shown the general connection plan of battery supply, vertical magnet, rotary magnet, private magnet, and the release is unchanged. But instead of shunting each relay or magnet with a non-inductive resistance, a thin copper tube was slipped over the iron core, and the working coil wound on that. This copper shield had the effect of a short-circuited secondary in a transformer, and took up much of the magnetic energy which would have produced very bad sparking at the contacts which controlled it.

The line relays were wound to 30 ohms with No. 29 wire,

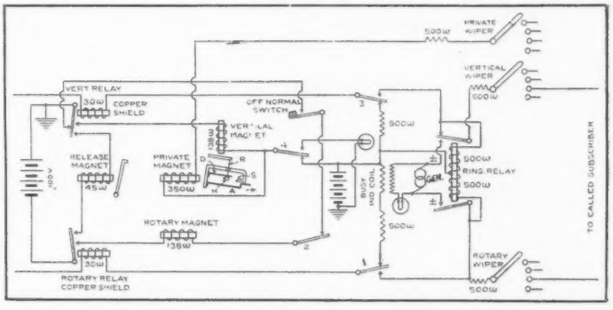


Fig. 64.—The Connector Circuit.

while the vertical and rotary magnets were wound to 138 ohms with No. 33 wire. The private magnet was wound to 350 ohms with No. 36 wire and the release magnet had No. 30 wire to a resistance of 45 ohms.

The rotary magnet normally had no circuit, so that if the rotary line accidentally swung into the ground it would only make the rotary relay click, but not move the wiper. The off-normal switch, which closes when the wiper shaft has made one step upward, completed the rotary magnet circuit.

The "busy condition" in the private bank was made ground, instead of negative battery as before. This made it necessary to connect the private magnet through side-switch 4 to negative battery while feeling for a non-busy trunk. This also throws the interrupter into negative battery instead of ground.

No busy test was provided on the last contacts of the bank, as it was found that it was very seldom that all trunks were busy.

The vertical and rotary normals came in to the inside contacts of side switches 1 and 3 as before, but there were no ringing relays here, their place being taken by a relay on the connector. If the called subscriber desired, he could get away from the calling line by merely operating his dial to call someone else. In so doing he would leave the calling line on the

*Continued from issue of September 26, 1908.

two 500 ohm retardation coils, through which that line could release.

In the second selector the rotary magnet circuit was completed through the off normal switch and a back contact on the vertical relay, as in the connector, Fig. 64. This is to keep the magnet from being energized while releasing.

The connector, Fig. 64, was greatly improved by the introduction of the ringing relay as shown. During the vertical

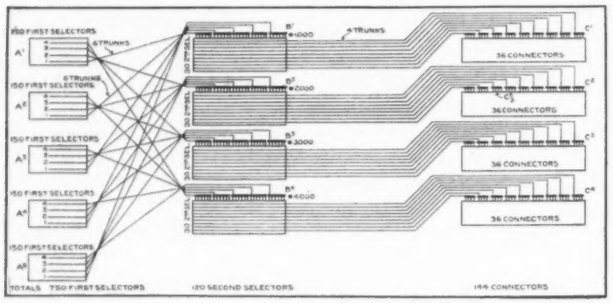


Fig. 65.—Wiring Plan of Fall River Automatic Exchange.

and rotary motions, the lines drew current through two 500-ohm resistances and the contacts of side-switches 1 and 3. When the side-switch was snapped into the second position (by the same means as in the New Bedford board) the 500 ohm resistances were cut out, and their places taken by the two windings of the ringing relay. When the ringing key at the calling station was pressed, it opened the line and grounded the vertical wire. This drew current from battery through all the vertical relays and the V coil of the ringing relay. The pulling up of the vertical relays did nothing. The energizing of the ringing relay broke the vertical line and connected the ringing dynamo to the called line. Thus only the bell at the called station rang. All the troubles of marginal adjustments of the line relays were avoided.

In releasing, both vertical and rotary lines were connected directly to ground at the substation, pulling up all vertical and rotary relays simultaneously. Though this action drew current through the ringing relay, the latter was not energized, as the coils were connected differentially.

The method of operation of the busy tone test on the called line is easily seen from the diagram (Fig. 64) and was substantially unchanged, except that the ringing generator furnished the tone through the induction coil. One peculiarity deserves to be noted. If the called line were busy, the private magnet, finding ground on the private contact, was energized by the resulting current. Though the wipers were resting on the called line, the side-switch prevented any contact thereto. But if the calling subscriber waited until the called line became disengaged, he could press the ringing key and get connection without further operation of the dial. Since the ringing key grounded the vertical line, it would pull up the vertical relay and the vertical magnet. The vertical magnet pawl could not act on the wiper shaft because of a cam, but its armature could pull on rod R and, through spring D, lift the rigid lever, M, of the private magnet armature. Allowing the end of the side-switch lever, S, to slip to the right as arrowed, thus moving all the side switch members, 1, 2, 3, and 4. Continuing to press the ringing key would now affect the ringing relay.

The plan of wiring the exchange between switches is shown in Fig. 65. The first selectors were grouped in five groups of 150 switches each, making a total of 750 lines served. There were four thousands provided, 1000, 2000, 3000 and 4000, represented by four groups of second selectors, each group containing 30 switches. Each group was subdivided into five groups of six second selectors each. Each group of six served one of the groups of first selectors, A^1, A^2, A^5. Thus, each first selector in A^1 had only the first, second, third and fourth levels of its bank wired—the rest were dead. Each of the working levels had six trunks, and each group of six trunks ran to a group of six second selectors in the proper thousand (B^1, B^2, B^3, or B^4). Each of the trunks terminated in B groups in a particular second selector. The bank of each second selector had nine of its levels wired up, each level having four trunks. Each group of four trunks ran to the proper group of connectors in the thousand to which it belonged. Each thousand had 36 connectors, nine groups of four connectors each. Each trunk of a group of four terminated in a particular connector of a group of four. The banks of these four connectors were multipled to the same subscribers' lines, so that a calling subscriber could reach the desired station in this group equally well over any one of the four trunks.

The operation was as follows: Suppose some subscriber in A^1 desired to call No. 2348. On operating the dial the first time, his first selector switch in A^1 would be lifted to the second level and automatically rotate until it found a non-busy trunk to B^2. It would thus gain connection to one of the second selectors in sub-group—B^2_1. The operation of the dial for the second digit would lift the wipers of the second selector to the third level, and automatically rotate them until contact was made with a non-busy trunk to the group C^2_3. The third dial operation would lift the connector to the fourth level, and the last pull would rotate the wipers to the eighth contact in that level.

An interesting feature in connection with the Fall River board was the connection between automatic and manual systems, though it was not put in at the same time. Fig. 66 shows the essentials of the line and cord circuits. J_2 is the line jack, with a line drop, for the magneto subscriber. The line is wired in the ordinary manner for the three-point jack used. Local calls between magneto subscribers were put up on the regular magneto cord circuits, which are so well understood that they need not be described here.

The special cord for connecting automatic subscribers to those whose lines terminated in the manual board had two plugs, P_1 and P_2. The former was connected directly to one side of a repeating coil, the center of which was connected through the clearing out drop to battery, the other end of the battery being grounded. The other side of the repeating coil was wired through the listening and ringing keys, K_1 to P_2, which was designed to be inserted in the magneto jack, J_2. A special cord was provided for operating the automatic switches. The dial, shown by its two springs and ground, was connected through the listening and ringing key, K_2, to plug, P_3.

The operator's telephone set was peculiar in the use of one of the key contacts to close the primary circuit. It made it

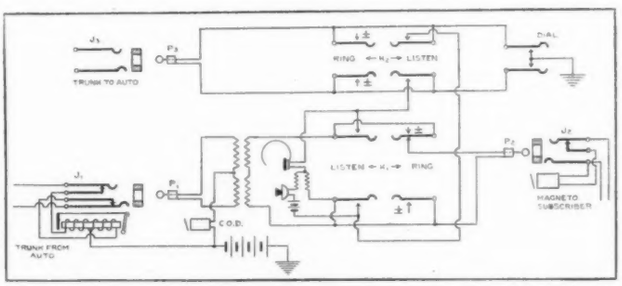


Fig. 66.—Line and Cord Circuits for Connecting the Manual with the Automatic System in Fall River.

necessary to connect one side of all the cord circuits together at the point M, which, it is to be suspected, tended to produce cross-talk.

Incoming trunk lines from the automatic exchange were terminated in jacks and drops, as at J_1. The jack was of the four-point type, so that the insertion of the plug would cut the drop completely off the line. The drop had at the center of

its winding a tap which was connected to battery. The trunk lines for one-way business to the automatic exchange were terminated in jacks like J_3.

When a call came from the automatic switchboard, the ringing current from the connector would throw the drop associated with J_1. The manual board operator, seeing the drop fall, answered with plug P_1. On getting the number, by means of key K_1, she would plug into the called line, J_2, and ring. When the conversation was completed the automatic subscriber would hang up, thereby grounding both sides of the line. This pulled current through both quarters of the repeating coil and through the clearing-out drop, thus giving the manual operator the disconnect signal at the same time that the automatic switches were released.

A call from a subscriber desiring a connection to the automatic system would be received over an ordinary magneto cord. On finding that the automatic board was wanted, the operator would disconnect her telephone set from the cord, leaving it in the jack, J_2. Inserting the special plug, P_3, in the outgoing trunk, J_3, she would operate the dial for the desired number. Ringing was done with the key K_2, the ringing current not being strong enough to operate the relays in the switches. The special plug was then pulled out, and the connection completed with the magneto cord. On the completion of the conversation the magneto subscriber would hang up and ring off, throwing the clearing-out drop. The manual operator would pull down the the connection and release by pressing a special key which grounded both sides of the line as required.

(To be continued.)

A Few Thoughts on the Advertising of a Public Service Corporation.*

I don't know whether I can observe Josh Billings' dictum: "Say as much as you like, but say it in a few words," but there may be something worth while in what I have to say. You may be interested in an outsider's view of some of the problems of advertising a public service corporation.

As a newspaper and magazine editor, as one who has championed the use of advertising space by the political parties, as one who believes that corporations have not been open and candid with a public whose impulse is to be fair, I venture to ask your indulgence, at the request of your committee.

In the first place you are confronted with a public suffering from much misinformation and you are charged with the failure of all your predecessors. The mere mention of public service corporation in the minds of the people is synonymous with private office intrigues, and on-the-quiet-companies with more or less immaculate public servants.

The people think the worst because you have not told them the best.

The first thing any advertiser needs is a personality.

Personality—individuality—is the power that counts in advertising. Most advertising is as much like all advertising as one maltese kitten is like another—which fact makes a market for tabby cats, boardyard cats and just plain cats.

The advertising will fail to create business in very notable proportions:—

a. If your old users are not in line.
b. If the local papers are not in line.
c. If the people are not friendly.

Your old users may be suffering from the lax discipline of your office force. If there is any one thing that injures the public service corporation it is the absolutely idiotic policy of permitting employees to manhandle the public.

When we realize the force of the fact that every mistreated customer is a liability and every pleased user an asset, we will be more careful to select clerks and department heads who can furnish information cheerfully and carefully.

An advertising campaign to be successful must have these departments in harmony to insure its success.

1. Advertising—which creates possible customers.
2. Sales—which makes customers.
3. Office—which keeps customers.

There must be co-operation and harmony among these at every step of the progress in a campaign of education.

There is a lot of valuable experience, sales making arguments going to waste when but one man in twenty has them.

There was a salesman selling a house-to-house specialty got up in a little meeting one day in answer to the simple question: "How do you get past the screen door?"

After several men had described as many more or less successful methods of getting the woman to open the door, he said: "I go up to the door and knock—and then I step to one side and look up the street with my back to the door, but close to the house wall. The housewife comes to the door, sees no one—opens the door to look out, I step back in the opening—make my approach and the trick is done."

Now that one little thing was worth thousands of dollars to his company, because it solved an everyday problem that had been baffling some of the best men who had been compelled to talk through the screen door, and could not get a chance to demonstrate.

These little weekly meetings of the canvassers can best be regulated by the men themselves, by letting them tell what they have done, how they got certain lines of business started, etc. The interchange of opinions and ideas will be valuable to them and to you.

In our own company we hold selling conventions in almost every sales agency every Saturday afternoon—for the purpose of bringing out new ideas and keeping everyone in touch with the progress of the work in the field.

What arguments sell goods in certain lines of business?

What particular machine is most useful in certain businesses?

What method was found most successful in gaining attention in a certain house where the conditions were thus and so?

A stenographer takes notes. The resulting experiences, arguments, ideas, systems, methods are invaluable ammunition for all, and these meetings are a constant source of inspiration and profit.

Don't look on your newspaper advertising as space taken to keep the newspaper "in line."

Use it because you want to tell the people what you know the people should know. I never knew of a paper to get after a company the people believed in, and if the company deserved criticism I never knew the buying of a few columns of space to shut up a paper whose criticism would hurt.

I heard a gas man say once that he believed in big type and prices—cut out the talk. So do I—when it comes to his kind of talk.

If you have something to say and will say it, to attract, interest and persuade—people will read it.

Some ads are not so long as they seem—others are so interesting and suggestive that it doesn't matter how long they are.

There is no syndicated advertising that can do half what you ought to be able to do.

Any man who comes to you with a patented, guaranteed-not-to-ravel plan of advertising that didn't grow out of a careful, painstaking study of your local conditions and what your company could do and do well, takes you for a fool and should be treated accordingly.

Any plan of advertising, any copy worth paying for, must grow out of the business as a result of the intelligent application of first principles of successful advertising.

Too many advertisements are written to the manager of the commercial department, and not to the possible customer.

* Abstract of an address delivered before the Michigan Gas Association, Kalamazoo, Mich., Sept. 24, 1908, by E. St. Elmo Lewis, advertising manager, Burroughs Adding Machine Company, Detroit.

I'd probably forget all about the sales manager, unless he had been an advertising man who had made good.

I'd find out what he had to sell—the kind of people he had to sell to—I'd sit at the complaint desk for a week or so—and go out with the canvassers now and then—then I'd go to the people.

People are more interested in people than in things—which is to say, people want to know about you and your satisfied customers, and who and what and where they are.

Once in a while it is well for the official to have an interview in the newspapers on some subject of local interest.

If times are getting better, be quoted on the subject and tell what the signs are in your business.

When you add new equipment talk about it—leaving an impression of the large capital it requires to keep up your service—but show what the new equipment means in service to the public. Don't give bald figures—but translate them into things of everyday knowledge.

Look out for the gum shoe publicity scheme, which offers canned interviews on everything from wicked municipal ownership schemes to the latest development in economics.

The articles prepared by experts in the preparation of articles for the public consumption, are good—but what sense is there in endeavoring to slip them in to the publications in the guise of "readers?"

Play the game above the board, gentlemen—the other way doesn't pay.

One word about the political work done in the advertising columns by some public service corporations. Most of it has been clear over the heads of the people—most of it has been written in the third person, and nobody stood for it. As I heard a neighbor of mine say of some advertising being done by a company during a franchise fight—

"All that hot air and not a man among 'em had sand enough to stand for it."

In the last analysis the copy must be addressed to the great mass of the people, illustrated by homely comparisons from their everyday lives, and talk to them in your everyday personality.

Your advertising manager, if you afford such a luxury, of course will keep in touch with all the civic bodies and have your civic importance reflected in the news columns. He is your mouthpiece.

Cut out the childish special editions of the local papers—give them some space all the time.

Cut out the write-ups—the programs—and all fly-by-night schemes.

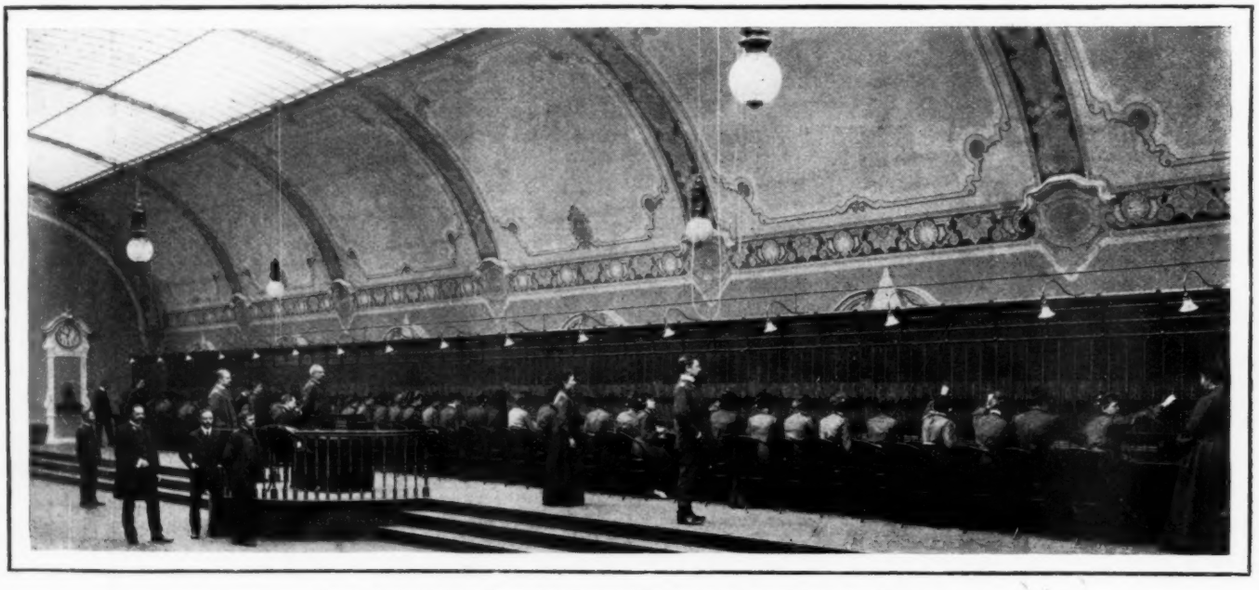
Put your advertising on a business basis.

Go to the people, fairly and squarely—educate them. The only thing a public service corporation conducting a fair and square business in a square manner, has to fear, is not the venal official, the corrupt newspaper, but the people whom it has kept in ignorance of its true purpose and mission in the community.

Breslau, A Modern German Exchange

By Frank C. Perkins

Views of the local and long distance switchboards in the Breslau telephone exchange, which represents typical modern German practice, show a somewhat closer approach to the designs familiar in America than has been attained in earlier installations.



The Subscribers' Switchboard in the Breslau, Germany, Exchange.

As is apparent from a close examination of the view of the subscribers' switchboard, the exchange is laid out to accommodate 20,000 subscribers. The subscribers' switchboard, at present, occupies one side of the long operating room. In installation details, the general plans familiar in America have been closely followed. The general arrangement of the building is evident from an examination of the original building diagram, in which notations appear in German. Upon this, the observer will note with special interest, perhaps, the low terminal room. This provision makes it possible to make a considerable saving in the installation cost by shortening the

lengths of cable, and it is understood that natural illumination has not been sacrificed to do this, as much window space is provided.

The main distributing frame and the relay rack, as indicated by the end views appearing in the cross sectional view of the building, are, generally speaking, of a type familiar in American exchanges, although differing to a certain extent in details of construction. The main frame has five horizontal rows of terminals extended along supports attached to the angle iron uprights. There are five groups of 20 pairs of arresters in each vertical, and cross wiring is distributed through rings and along the horizontal supports in the manner customary with this type of frame.

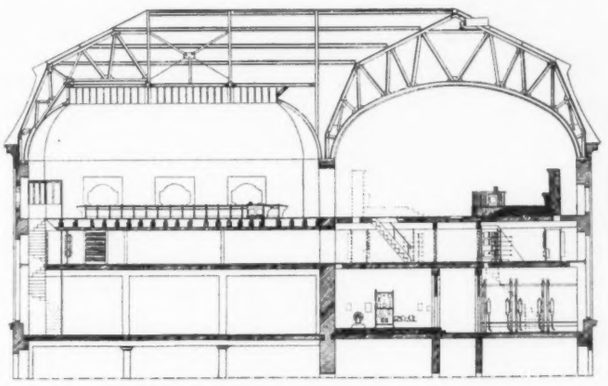
The method of bringing cables from outside into the main distributing frame is shown in the sectional view of the building. The large units are brought into the lower part of the building, and attached to potheads, through which connection is made to the smaller cables which lead to the separate verticals of the main frame.

The relay rack is installed in a line parallel to the intermediate distributing frame, which is of a special type, much narrower than the one commonly used in America. The cabling between the several frames, and from the frames to the switchboard, is done in units of twenty-one pairs; the subscribers' line circuits are of a two-wire multiple type, making it possible to use jacks very closely spaced on centers, as is necessary in the large multiple in this board. In the subscribers' line circuit a double wound wire relay is used, its coils being connected permanently into the line.

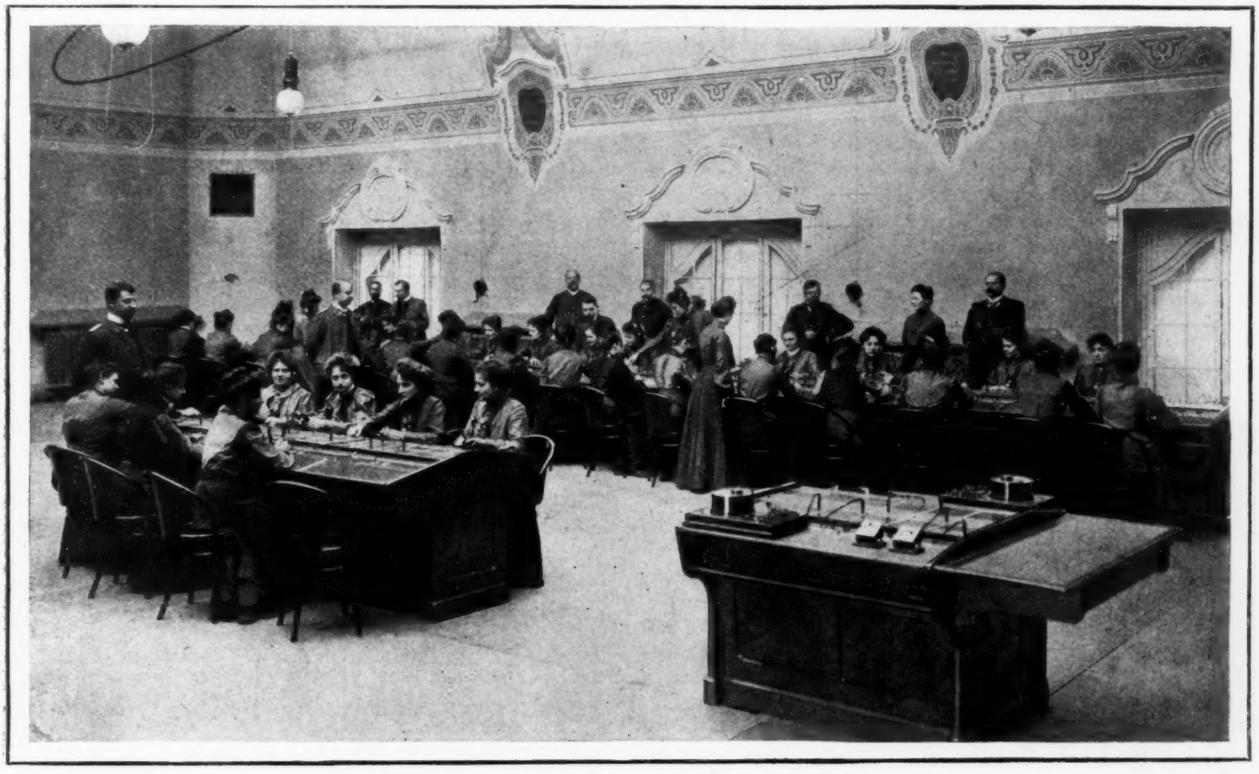
In the same room with the toll board is installed a wire chief's table, equipped with a complete outfit of sensitive measuring instruments, bridges, and circuits for making connections with the lines and performing all necessary tests for locating trouble.

The storage battery equipment consists of two batteries, each of ten cells. Ringing and charging machines are of German manufacture, but present no particularly striking points of construction which need be noted.

As in many foreign exchanges, one of the principal interests in this central office is furnished by the design of the building itself. The height of the operating room, the remarkably open lighting arrangement, and the dignity of the decorative scheme combine to produce an impression which is not commonly approached in the central offices of America.



Sectional View of the Breslau Exchange.



Toll and Testing Boards in the Breslau Telephone Exchange.

Business Increasing at Grand Rapids.

Among the Independent companies which report a very gratifying increase in business, is the Citizens Telephone Company of Grand Rapids. Orders for new installations are coming in considerably faster than during the first six months of the year, and the improvement is steady enough to indicate that business is taking a boom as compared with that carried on during the first half of 1908, which, however, showed a very satisfactory net growth.

The Cost of Rural Telephone Service*

By M. D. Atwater

It is the general rule with all labor-saving machinery that the more useful it is, the more it costs. Take harvesting machinery, for example. First, we had the sickle, then the cradle, then the dropper, and now the binder. Each one cost a great deal more than the one before. Look at the railroads. Big engines cost more than little ones, and the little ones cost more than teams; but the improved machinery is so much more useful that it is economical, even at the increased price. And some misguided people who are contemplating the project of organizing a mutual telephone company and wasting their own stock of labor and the sweat of their own brows to build an additional and unnecessary telephone plant to "save" expense are just as far wrong as if they tried to reap their wheat with a sickle and haul it to Chicago in wagons.

I foresee the day when farmers will be paying twice or three times as much for their telephone service as they now pay, and they will be doing it cheerfully, too, because it will be five or six times as much use to them. This will be partly because the farmer's time, and his boys' time, and the time of his wife and daughters, and the time of his hired man and of his teams, will be worth more money all the while. Many of you busy people will have individual lines then—no time to stick around while the gossips count their chickens and their neighbors' failings. You will have field telephones then—with farm labor a dollar and a half a day, and a team of horses worth $300, you can't afford to have the team stopped while the man walks half a mile back to the house for another clevis or disk for the planter, or some seed or binder twine. If the present kind of telephone continues in use, and the inventors do not seem to be making any radical change, you will soon see lead cables running along the main roads in the country just as they do now in the city, and the street-corner pay station will be just as common at country crossroads as the signboard is today.

You must expect increasing rates for the same service because of the increasing cost of labor, and I, for one, am glad to see working men and women get a larger share of the world's earnings. Why, one of your own implement dealers told me within the last twenty-four hours that you are paying $140 this year for the same harvester that you bought last year for $125—all this on account of the increased cost of labor.

The truth is that the public must be educated first as to the great value and utility of the ever-wonderful telephone, and second, that they must learn, either by investigation or by sad experience, what is the cost of giving this service. As was well said by Governor Hughes of New York not very long ago:

"Ignorance and suspicion breed distrust, and can not supply remedies. And wherever, in lieu of attempting arbitrarily to deal with matters which are intricate and require analysis, we can make provision for suitable study and authoritative report, we add to the security of business by insuring intelligent governmental action. I am a firm believer in the sound judgment of the people. We can not expect to be altogether free from the foolish propaganda and absurd vagaries, but they will be rendered harmless if the facts to which they are applied are generally understood."

Co-operative administration is the worst possible kind. If every soldier had an equal vote on how to run an army, that army would get licked. In almost all communities that have mutual companies, there are a lot of fueds and neighborhood quarrels as a result. Co-operative administration means that you don't clear a bad case of switchboard trouble until the next annual meeting. "What's everybody's business is nobody's business," you know. Mutual supervision means that you harness up your teams and drive off in the opposite direction from the work and hold a lengthy discussion about it. Why don't you try co-operative farming? You can't even agree with your own brother on the management of a farm. How would a mutual sawmill do? Get your lumber out for nothing. A mutual threshing machine would be a good thing to begin with. All take a share in the profit, stand an assessment all around for the wages and operating expenses, and get all your grain threshed free. If some renter couldn't pay in money, let him run the engine for a week.

In Salt Lake City they had a great mutual store—the Zion Co-operative Mercantile Institute. It filled an entire block. You could drive in there with your produce and get tickets for it with which you could purchase whatever you needed. And that system worked just as long as a great genius like Brigham Young backed it up with absolute power and a band of "destroying angels."

But the road supervisor couldn't get a fair amount of work out of each of you on the roads, now, could he? And you had to give up that old-fashioned system and pay your taxes to have the road work done under contract by regular contractors.

You think the children can take care of the lines on their way to and from school. When did they ever do anything toward keeping up your fences on their way to and from school? They are so apt to replace a rail that they have knocked off a fence. I never yet saw a school boy take staples out of his pocket and fix up a wire fence. And if they undertook to clear a case of line trouble, they would knock off a bracket for every cross they clubbed out. And that's not clearing trouble—that's just making it worse. Let your boys learn to be Edisons from books in a systematic way.

And that reminds me. I was walking over Sand Hill not long ago, and that big concrete drain you folks have paid taxes to build was all choked up with cornstalks and sand from the hard rain three days before. The next rain was sure to overflow and do some damage. There were tracks all along of farmers who had walked up that hill, and there lay the checks they had used to spell their teams, but a man had to come from the city to throw out that armful of cornstalks. Those farmers valued their time too much to do a little chore like that.

By the way, who is going to keep your accounts? Some mutual companies have an awful lot of trouble collecting their money. That's what starts some of the quarrels and feuds. If you get somebody to keep your accounts, and do it right, for nothing, you will surprise me. One man I know says it takes him an hour or two every night—and they have only eighty telephones. He's kicking for a salary.

Now you plan to pay your operator $2 for each subscriber per year, or $200, which is a little over fifty-four cents a day—kerosene fifteen cents a gallon, fuel $5 a cord—a day of 24 hours, mind you, and seven days a week of work, requiring high intelligence, fidelity and patience. It isn't right to pay so little and expect so much. You wouldn't expect girls to work in your household that way. You pay them $2.50 to $4 per week, and board for working ten or twelve hours a day, and they get off to go to evening meeting or take a buggy ride, just like the rest of the family. They used to have orphans bound out, but not since

*Abstract from a speech delivered to rural telephone subscribers, reprinted from the Central Union News.

corn was 50c and wheat a dollar. And yet, you expect a family to give you continuous service day and night and Sundays and holidays, and pay the rent or the taxes and up-keep on a house, and furnish light and fuel at $3.80 a week, and board themselves. Why, the time of any one member of that family is worth more than that. There is no possible way that anybody can give even a fair service continuously at less than $1.50 per month, or $18 per year.

What's fifty cents a month to you anyhow? A bushel of corn? You wouldn't begrudge that to your horses if it made them stronger and better able to work for you? You never complain when your wife takes a bushel of corn for the chickens. You can save that much each month easily simply by protecting your farm machinery from the weather. You remember numerous times when a single call put through has saved or earned for you more than that. Suppose there's something afire on Mr. Shufflebarger's place over on the island and they want to let him know about it. What's the difference in value to him between good service and poor service in a case like that? Well, it's a heap more than $6. When you want service—like eggs— you want it good or not at all. The best is none too perfect yet. You wouldn't think of making for yourself a rope harness just to save $35, would you?

This mutual talk reminds me of the time Elder W. B. F. Treat drove out of Martinsville one Sunday afternoon to marry a couple at Hurricane Bridge. The liveryman asked him $3. He tied the knot good and tight, and entertained the whole company all evening with stories. As he started to leave the happy bridegroom said: "Now, Elder, you know we ain't very well fixed, 'n I 'aint got no money, but I am suttin'ly 'bliged to you for splicin' us up tonight, and if it's satisfactory to you I'll tan you a couple of groundhog hides." Now, the elder may have needed a little piece of "whang" to repair his suspenders, but it wouldn't pay that livery bill.

My friends, you can't pay the expenses of a telephone exchange with a "couple of groundhog hides."

Inspecting Cables and Locating Faults

By Frank L. Clark

As practically all aerial and underground telephone cables are of the dry-core, paper insulated type, and as the paper performs its necessary function as an insulator only when perfectly dry, a systematic inspection should be made quite frequently in order to avoid serious trouble.

A hole through the lead casing will admit moisture which, owing to the construction and material of the cable, spreads rapidly, and if left without attention long enough, will lower the insulation resistance of the entire cable to such an extent as to produce cross talk and cross ringing due to leakage from wire to wire, even though the hole through which the moisture originally came may have been located and repaired. The act of closing the hole in such a way as to seal the moisture within the cable may simply increase the trouble. In exchanges where large amounts of cable are used a high-grade set of measuring instruments will quickly pay for itself; but when only a small amount of cable is used, testing is just as necessary, and fair results can be obtained by simple methods.

A test for determining whether or not cable conductors are well insulated from one another is readily made with no other apparatus than an ordinary receiver connected in series with one or two cells of battery, and the grounded sheath, with the other terminal of the receiver is connected to a screw driver, or other metallic terminal, by a flexible conductor. This terminal can be placed on the vacant conductors of the cable, one at a time. On first making contact with the conductor a click will be heard in the receiver, due to the capacity of the cable, but there should be no sound on the second or third connection, other than that produced by induction, which should not be mistaken for an indication of a fault. This test will be found to be a very good one on cables where there are vacant conductors for each separate branch of cables.

In cases where there are no vacant conductors in a lead that is suspected, a few of the conductors can be disconnected from the switchboard, and the test made as before. In making this test it must be remembered that the subscriber's line wire, or "house drop" is connected to the cable conductors, and, should faulty conditions appear, the cable conductor should be entirely free from every other wire, fuse or piece of apparatus which might cause trouble before the cable is decided to be at fault.

It is advisable to make tests of this kind at frequent intervals after thunder showers, or whenever anything has happened which might produce pinholes, as it is important to locate and repair such a fault as soon as possible, in order to prevent the moisture from spreading beyond the reach of the repair man's hot paraffine. Of course, this test is not at all helpful in determining the actual location of the fault. This must be done by examination, often a tedious job.

In the larger exchanges a wire chief's desk is provided with necessary apparatus for testing lines with a voltmeter. Arresters in up-to-date exchanges are so made as to allow a test being made without unsoldering the wires. The simple act of inserting a plug, made for the purpose, in the arrester, disconnects the cable conductor from the switchboard wires, so that a test can be made of either the switchboard end of the line or of the cable conductors. Where exchanges are so equipped it is advantageous to test a certain number of lines from each cable every day, keeping a record of lines tested and the trouble found, if any. If this work is done during the slack time

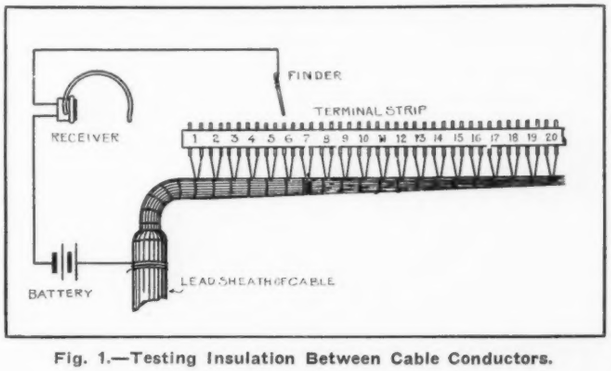


Fig. 1.—Testing Insulation Between Cable Conductors.

of the day, any general difficulty may usually be located before it occasions actual complaint from subscribers.

After a conductor has been found in trouble, and with all drop wires and fuses disconnected, if the trouble still shows in the cable, the application of some method of locating the fault is the next thing in order.

The test to be described can be made with a slide wire form of the Wheatstone bridge. If such an instrument is not at hand, it is easy to make one which will answer every purpose. The wire used should be bare, of uniform size and re-

sistance, should be placed so as to avoid kinks or short turns around a conductor, and the divisions should be of equal length. The diameter and resistance of the wire is not an extremely important item. If it is most convenient to use, say, a piece of No. 22 B. & S. gage German silver wire, with a pair of dividers space off one hundred spaces of one-half inch each, and place a small nail or binding screw at each end and

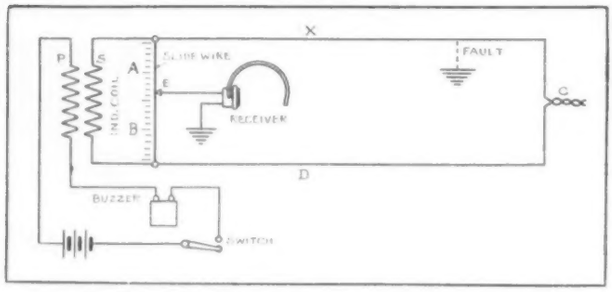


Fig. 2.—The Slide Wire Bridge Connected Ready to Use.

stretch the wire between these two points, and over the scale of one hundred divisions.

The slide wire bridge fully connected and ready for use in locating the fault is shown in Fig. 2, where P and S represent the primary and secondary of an ordinary common battery induction coil, the primary of which is connected in series with two or three dry cells, an ordinary buzzer or bell, and a switch for breaking the circuit. The secondary is connected to the terminals A and B of the bridge. One terminal of a receiver is connected to ground and the other to the finder, E, which may be a short piece of No. 12 or No. 14 B. & S. gage hard drawn copper wire. Where it is not convenient to connect to ground, the lead sheath of the cable under test may be used.

The induction coil used may be of any kind or make, having a primary winding of resistance low enough to allow the buzzer to operate through it; but, as there is sure to be some disturbance set up in the cable, the secondary should be wound as low as possible, and, with this end in view, a buzzer of comparatively high resistance will give the best results. Usually there can be found one good conductor in the cable, and the one chosen should be disconnected from everything so that it is entirely free, and tests clear. It will then serve in a loop test, as hereafter described. The good and one bad wire should be joined at the distant end of the cable, it being understood that the two conductors are of the same size and resistance, which would be the case where both are in the same cable.

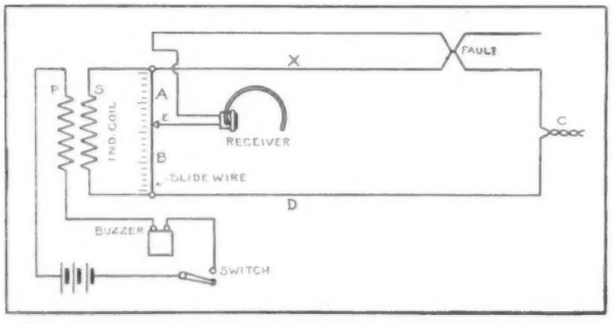


Fig. 3.—Connections Where Crossed Conductors Are Known.

After the apparatus is set up and the connections represented are made, the finder E is moved over the slide wire A B until a silent point is found. The distance to the fault is found by the use of the formula $\frac{2\,AD}{A+B} = X$, in which D represents the length of the cable in feet, B the number of divisions on the slide wire bridge to the point of silence, A the number of divisions from this point to the "A" end of the bridge, and X the distance in feet to the fault. As a check, the line wires connected to the terminals A and B can be reversed, after which the point of silence should be found on the A side of the bridge and the same number of divisions from the end as was previously found on the B side.

When telephone subscribers repeatedly complain of false rings, and of hearing other subscribers talking, test should be made to determine with what line or lines the wires leading to the station of the subscriber who has entered a complaint are crossed. This can be done in several ways.

On a magneto board having grounded lines, the line under test can be disconnected from the switchboard and the outside, or cable conductor connected to a grounded generator circuit. As soon as this is done the drop of every line crossed with it will usually fall.

For common battery lines, and magneto lines on which the trouble is not found by the method just mentioned, the line under test may be disconnected from the switchboard and a ground connection made with one wire at a time, taking note of signals thrown or other trouble caused on lines that are thought to be crossed. If this method does not locate the line crossed, the lines in the same tap or cable with the line under test can be disconnected from the switchboard, and a ground put on the pair under test, after which a test made to determine

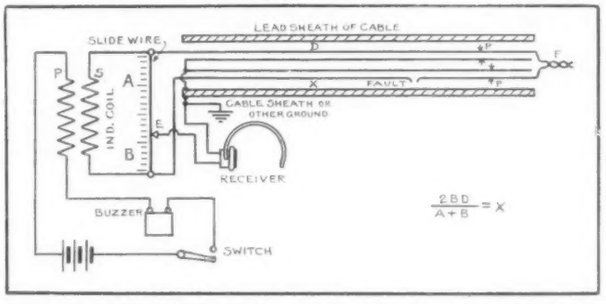


Fig. 4.—Connections to Locate Open by Capacity Balance.

on what other pair the ground appears, will enable the troubleman to definitely locate and clear the fault.

When the cross has been found to actually exist, and the wires which are crossed are known, connections can be made to the bridge as shown in Fig. 3. When the silent point has been found, the distance to the fault will be found by the formula $\frac{2\,AD}{A+B} = X$ where a good and bad wire are connected at the far end, and to the terminals of the bridge, the other bad wire being connected to the receiver.

Open conductors can be located with a fair degree of accuracy by connecting to the bridge as shown in Fig. 4. When the silent point is found the distance to the open is found by the formula $\frac{2\,BD}{A+B} = X$.

Where A is the number of divisions from the terminal of the end of the scale connected to the good conductor to the point of silence; B the number of divisions from the terminal connected to the broken conductor to the point of silence, D represents the distance in feet from the bridge to the point E where the good and bad wire are joined together, and X the distance in feet from the bridge to the open.

As an open place in a wire is difficult to locate accurately on account of the presence of trouble in some portions of the cable, such as low insulation, which will have a tendency to make capacity tests such as described of little value unless all possible means of checking are resorted to, it is always best to make tests for open wires from both ends of the cable. If the two measurements check the open should be easy to locate.

Elisha Gray's First Telephone Conversation

Elisha Gray's First Telephone Conversation.

Mr. V. C. Gilman, now in business in the Germania Life Building, St. Paul, Minn., is perhaps one of the first men in the world to have seen a conversation carried on by means of an electric telephone. The experimenter was Elisha Gray, and the story of the incident is graphically set forth by Mr. Gilman as follows:

In 1874 or 1875 I was in the employ of Sidney Shepard & Co., Buffalo, N. Y. It was a very old and wealthy house, established in 1836. The firm, at that time, consisted of Mr. Sidney Shepard, Mr. Augustus F. Tripp and Mr. James G. Forsyth. Mr. Shepard lived in New York and had no active part in the business; Mr. Tripp looked after the manufacturing part at the factories, about two miles from the store and offices, where Mr. Forsyth managed the business. All of the old firm are now dead.

The store and factories were connected by telegraph. The offices were old-fashioned with two rows of standing desks, where about twelve clerks worked back to back, but with plenty of space between. Then came my low desk (with the telegraph key on it), and then Mr. Forsyth's. One morning there was a sudden commotion, and a tall man wearing a very high, old fashioned, silk hat—like that shown in some of the pictures of Lincoln—a long linen duster and a long, yellow beard came striding toward me with a very determined air. He looked like a crazy man, and, without any preliminaries, asked "Where's the telegraph key?" I said "Here." "Get away, I'm going to disconnect it." I protested, mildly, because he looked insane and appeared just ready to "break out," told him it was in use all the time, etc. Without attempting a dialogue, the conversation ran exactly (on his part) like this.

"You do all the telegraphing at this end, don't you?" "Good deal of bother; constantly interrupting your other work, isn't it?" "Be a good deal easier if *anybody* could talk directly to the factories, wouldn't it?" (Here I said, "Yes, but we haven't got speaking tubes that length yet.") "Talk right over the wire—anybody—just like we are talking now." Then I *knew* he was crazy. Talk over a wire. Mr. Forsyth knew it, too, and motioned to me to let him have his own way.

Mr. Gray removed the key very deftly, took a parcel from a small bag and laid it for a moment on the desk. It was a perfectly square box, about three inches in size, made of an old cigar box and put together with pins; had a hole about three-quarters of an inch in diameter on one side and a wire attached on the opposite side. After connecting it with part of the telegraph instrument, he looked at his watch, then left it and began pacing around in a very nervous way. I had a sort of indefinite notion that he had a crazy idea that it would begin talking in a minute. Some of the clerks were inclined to laugh, but Mr. Forsyth, who, with myself, was nearest to him, frowned in such a way as to stop that. Mr. Gray would stop often, look at his watch and then stare at nothing apparently and then walk some more. It was very trying upon my nerves and when he abruptly asked "What time you got?" I jumped, but told him three minutes to eleven. In a loud voice he replied "You're slow; it's just eleven." Then grabbed up the box, and, placing the hole near his mouth, said "I say; I say; hello, hello." (Babies are born saying "Hello," now, but it sounded mighty queer then.) He would say "I say," and "Hello" into the box several times and then quickly slap it to his ear. He continued this very rapidly for three minutes, growing more nervous and excited all the time, and raising his voice accordingly. I was frightened, and never before had realized how long three minutes was.

All at once his whole appearance changed and the most wonderful expression of extreme joy I have ever seen spread over his face. "That you, Mr. Tripp?" "Do you hear me all right?" "Yes, yes, I hear you perfectly." "Yes, yes, thank God." Then after a little he suddenly turned and asked "Who is Victor?" I said "I'm Victor." "Mr. Tripp wants to talk to you."

Now, remember that we did not know that he had already been to the factory office, and connected his little box there; we could only hear one side of the alleged "conversation," and I was not inclined to get very near him. However, I did, keeping a wary eye upon him all the time, although he now looked like a different man. I said "hello" and then changed the box to my ear, expecting only to do it two or three times and say it was "fine" or something like that. If you have ever "seen a ghost" when a small boy, you can imagine how I felt when I heard Mr. Tripp's voice. Cold chills ran up and down my spine; I am sure my hair stood up. I nearly collapsed, but said, "Is that you, Mr. Tripp? Where *are* you?" When he said "At the factory," I could hardly believe it. It seemed as if he must be right near me, playing a joke. After talking for a while, he asked for Mr. Forsyth. I told him Mr. Tripp wanted to speak to him, and he gave me a look of mingled pity and contempt and paid no attention until I urged him, and assured him that I could hear Mr. Tripp. He was rather large, and very dignified, and when he took the box he did it with an air of "to prevent trouble with these lunatics." In a very drawling voice he said "Hello." The next instant he staggered and exclaimed "My God! is that you, Tripp?" After talking a while the old cashier, Mr. Spencer, the bookkeeper, Bowman, and others tried it.

Then Mr. Gray, who was now beaming with happiness, explained that he had been at work on this "talking machine" for a long time and had tried it over a short wire in his house, but could get no one to let him try it over wires out of doors until he came to Buffalo to see Mrs. Morse, a relative, I believe. Mr. D. R. Morse was president of the Erie County Savings Bank; both he and his wife are dead. Mr. Morse took Mr. Gray to Mr. Tripp and the latter readily consented to the test. They had arranged to call at exactly eleven o'clock as, the keys being gone, there was no way to call. Mr. Gray explained his excitement by his intense hope that it would work over wires out-of-doors and twisted around insulators, and, owing to the difference in watches, which caused a long delay in getting an answer to his call, he had feared that it was going to prove a failure. He said that it was better and clearer than over the short wire he had used at home, and thought that perhaps the batteries had something to do with it. He left the next day for Chicago. I never saw him again and, a long time afterward, I signed an affidavit that I had talked as above.

Three or four years afterward there was an exchange in Buffalo. At first we had just the "receiver," that is, we talked and heard through the same piece. For private residence the rate at first was $1.25 per month, but it was soon advanced. Later a most wonderful addition was made to it. They put up a "long distance" line to Niagara Falls. That was considered the acme of achievement. Today a man who cannot "get" somebody five hundred miles away in two minutes, kicks.

Telegraph Operator Surprised by Talking Telegraph Relay on Composited Line.

Occasionally apparatus not at all related in appearance to the ordinary telephone receiver is found to lend itself to the reproduction of speech. Stories are current in some telephone exchanges of instances where magneto bells have been heard to talk. With the increase in the use of composited telegraph lines, over which service is given to railway employees, reporting of cases where telegraph relays

are said to talk is becoming more and more common. One of the interesting occurrences of this kind recently happened in the office of the Grand Trunk Railway System at Keene, Ont. H. Nelson, the company's agent, was sitting near his instruments one night when he heard voices as of people talking. Suspecting that there might be some trouble with the telephone which caused sounds to be reproduced in the receiver, even though that instrument was on the hook, he lifted it, but as the voices had apparently stopped, decided it did not come from that source.

He located the sound, on its reappearance, in the relay of one of the telegraph instruments at the other side of the room. He reports that he could hear conversations distinctly, one man saying, "How are you getting along with the wall," the other replying "Not bad."

He reports that voices were very distinctly heard and on subsequent occasions he has heard conversations which were reproduced by the relay with clearness.

Austrian Telephone Development in 1906.

Although European statistics compiled by the staffs of the several administrations having charge of the telephone systems under their respective governments are slow to come to the public, they are of undoubted interest. The following report of comparative development in Austria, for the years 1905 and 1906, reproduced from the Journal Telegraphique, shows the progress made in the intervening year.

	1905	1906
Exchanges	335	388
Length of underground telephone wires, in kilometers	215,344	277,869
Length of aerial telephone wires, in kilometers	61,637	66,546
Totals	276,981	294,415
Length of interurban trunk lines, in kilometers	7,035	7,550
Number of pay stations	737	806
Number of subscribers' stations	53,051	58,558
Number of localities provided with telephone service, including public telephones and central offices	780	899
Number of telephone instruments	55,540	61,608
Number of local conversations	164,158,597	183,513,636
Number of interurban (trunked and toll) conversations	2,315,586	1,972,824
Total number of conversations	166,474,183	185,486,460
Number of telegrams transmitted by telephone	1,799,770	2,035,114
Population per public telephone	21,719	18,950
Number of conversations per 1,000 population	6,366	7,093
Number of subscribers per 1,000 population.	2	2.2
Number of private telephone installations (for which a special concession is necessary)	1,314	1,362
Total length of private telephone lines, in kilometers	8,708	9,039
Total number of private telephone stations.	7,137	7,373

The receipts from the government telephone system in 1906, was 10,303,647.57 fr., of which the principal items were:

Receipts from subscribers	7,526,416.89 fr.
Trunk and toll messages	2,448,711.86 fr.
Local conversations (pay station)	93,360.98 fr.

The total receipts were 1,150,563.88 fr. in excess of those for 1905. The expense account for the telephone system is not separated from that of the telegraph system, so it is impossible to give a summary.

Kansas University Men in Telephone Work.

Among the college men engaged in the telephone business, graduates of the University of Kansas, especially of the classes of '93 to '95, are quite numerous in the lists of those who have advanced to positions of prominence. Among them, said a graduate recently, are:

J. P. Cracraft, '95, who is head of the Cracraft-Leich Telephone Manufacturing Company of Genoa, Ill.; Ned Newton, '95, superintendent of the Northern Electrical Company; George Hale of the Western Electric Company; "Al" Champlin, '95—the 4-year halfback—who is now doing well in the telephone business in Newton, Kansas; "Jim" and John Noble, '93, the former chief engineer and latter general manager of the Pioneer Telephone & Telegraph Company of Oklahoma City; "Bill" Mattison, '95—another halfback who is at Cherryvale, Kansas; J. W. Wright, general manager of the McPherson Telephone Company in Kansas; Fred Simpson, '93, purchasing agent, and Fred Penfield, traffic manager of the Missouri & Kansas Telephone Company. Will Sherrett is with the Western Electric Company of Chicago, and Louis Flint is in charge of the testing department of the Kellogg Switchboard & Supply Company.

Others are: "Jim" Kelsey, who was catcher on varsity ball team in '94 and '95. He was for several years professor of telephone engineering at Purdue University, and is now in Chicago; Harry Faris, '00, and Roy Hinman, '04, both employed as salesman by the Chicago firm with which Kelsey is connected; Fred B. McKinnon, '93, manager of three telephone exchanges centering in Tonganoxie, Kansas; A. B. Clark, '95, manager of the Lawrence Telephone Company at Lawrence, Kansas; Geo. Soxman, '95, division superintendent of the Southwestern Telegraph & Telephone Company of Dallas, Texas; W. O. Anderson, '95, engineering department of the Western Electric Company, and Oliver Shiras, late general manager of the Wire & Telephone Company of America.

A Telephone Operator's Chateau.

That the telephone operators can use their hands and brains for other things than making connections through a switchboard is shown by the accompanying illustration. This cosy little cottage was built by Miss Josephine L. Reynolds, one of the operators of the New England Telephone & Telegraph Company at Surfside, Mass. Last spring Miss Reynolds was working evenings in the telephone exchange and during her spare time in the afternoons dug the post holes and built the cottage without the aid of mere man.

Capt. Joe's Chauteau and Its Builder.

The cottage is tastefully furnished with pictures, easy chairs, and also has a "cosy corner" containing a number of striking sofa pillows. On stormy evenings "Capt. Joe's Chateau", as the cottage is called, is the scene of many enjoyable gatherings of telephone operators.

Miss Reynolds is justly proud of her efforts in the carpenter line, and takes much pleasure during her spare time in entertaining friends in the cottage.

Telephony in South Africa.

According to the *British South African Export Gazette*, a telephone line 210 miles in length is to be constructed between Pietermaritzburg, Praetoria and Johannesburg. It will be the longest telephone line in the Transvaal. A telephone exchange is also to be installed at Beira.

The Telephone in the Courts

Conducted by A. H. McMillan

Franchises from Kansas Cities.

Enclosed you will please find copy of our city franchise, also of an injunction against us by the city. You will notice by the franchise that there was no mention made as to whether or not party lines should be used. We went before the council last January, and asked for a raise in our rates and were refused, but were told that we could use party-line service; we began this but were stopped on the ground that we had no converter, but if we should install one, it would dissolve this injunction. We have a Holtzer-Cabot converter, and have asked the council to dismiss this case, which they refuse to do.

It is up to a time when we must either give party line service or have a raise in our rates, and we intend to fight this out in court on the ground that we are living up to our franchise.

If you have any suggestions we would be very glad to hear from you.

The question of whether a party line is prohibited by the franchise, which requires you to use a metallic circuit, is to be determined by the judge, after hearing the testimony. The testimony for you to offer is to the effect that a metallic circuit may be either a party line or a single wire. We do not see how any court could say that your franchise required you to install a converter or provided what apparatus you should have in your system.

We suggest that you take the position that your city franchise is a contract without consideration, contending that by the state law of Kansas, you have the right to use the public roads, streets and waters of the state so long as you do not incommode the public in the use of them, and that under these circumstances your franchise from the city was unnecessary. In an Ohio case the court held that a franchise was a contract without consideration where the state law permitted the erection of lines in cities.

Macklin vs. Home Telephone Co., 24 Ohio Cir. Ct. Rep., 446.

You also might take the position that the council has no authority to fix rates in the franchise, and hence, that this portion of the franchise is void. Sec. 1346 of the General Statutes of Kansas (1901) gives the council the right to specify where posts shall be located, the kind of posts to be used, and the height at which wires are to be run, and the council may also direct any alteration in the line or height of wires, first giving the company the right to be heard. This section would not be authority for the council to fix rates.

Changing Shares of Stock.

I am secretary of a Farmers' telephone company, incorporated under Kentucky laws for $500, shares, $10 each; later increased to $9,000. Now the company has decided to reduce the price of its shares to $5.00 each in order to take in more members. It is on the mutual order, and each member is allowed three shares only, no more, nor less.

Please tell us whether we can change the old certificates already issued (297 cert. issued) to read $5 per share, or will it be necessary to issue new certificates out and out, and call in the old issue.

The proper method for you to pursue is to amend your articles of incorporation, making the shares of stock $5 each instead of $10 each. Then call in the old certificates and issue in their place new ones, reading $5 per share instead of $10.

Deed Granting Water and Telephone Rights Construed.

The East Jersey Water Company was incorporated in 1889, its object being the storage, sale and delivery of water and the construction and maintenance of the necessary reservoirs and lines for that purpose. In constructing its line it built across certain farm lands owned by Daniel Hepburn and others who made deeds giving the company the right of way over their farms to lay, operate and maintain a water pipe with the right to set up, operate and maintain a telegraph and telephone line thereon. The water company sold its water supply system to the city of Newark, and deeded to the city its right of way in the pipe lines and also in a telephone line that it had constructed partly on the pipe line right of way. The city of Newark subsequently granted to a telephone company the right to operate and maintain a line of telephone and telegraph along the right of way, and the telephone company proceeded to establish a public telephone line over it. Hepburn and the other land owners interfered with these operations by removing all wires from the telephone lines. The telephone company sued for injunction, which was granted by the lower court, but the decree allowing it was reversed by the court of errors and appeals of New Jersey.

The court in construing the deeds held that the clause relating to telegraph and telephone lines was merely incidental to the principal object of the grant, viz: the construction and maintenance of the water plant. Hence, the deeds were held not to be broad enough to confer on the telephone company the right to use the right of way for the maintenance of a commercial telephone line. The right granted was held not to allow the erection of an unlimited number of wires, but only such as were reasonably necessary for the operation of a pipe line. The application for injunction against the removal of the lines was therefore denied.

N. E. Telephone & Telegraph Co. vs. Hepburn, 69 Atl., 249.

Injunction Against I. B. E. W. at Wichita, Kan.

After a short hearing in the circuit court, a temporary injunction secured by the Missouri & Kansas Telephone Company against Wichita Union No. 144, International Brotherhood of Electric Workers and others about two years ago, has been made permanent by a final decree of the court.

The temporary injunction was issued by the court at the time of the strike of the electrical workers employed by the Missouri & Kansas Telephone Company about two years ago. The strike was a general one on the telephone company's system. After it had been on for several weeks, the company shipped non-union electrical workers into Wichita, but the local union men attempted to prevent the non-union men from working. For several days crowds of union men swarmed around the building of the telephone company on North Market street, and prevented the strike-breakers from leaving. Finally, after there had been disturbances between the men, the Missouri & Kansas company secured a temporary injunction to prevent the electrical workers from interfering with their employes. Protected by United States officers the strike-breakers were then sent out to work on the lines of the company.

City Authorities Cut Poles at Ithaca, Mich.

At Ithaca, Mich., the village council requested the Union and Michigan Telephone Companies to remove their poles from the streets of the village, contending that the right to use the streets for the purpose of setting poles is under the direction of the council. The village authorities state that the poles as now set stand in the gutters, and hence are an interference with the lawful use of the street. They also desire to build a side walk with which they say the poles interfere. The Union Telephone Company asserted that it had the right to the use of the streets for poles under its franchise, and that as the removal of them would cause great expense, the village should bear a portion of it. As the Union Telephone Company did not comply with the request, the city authorities proceeded to remove the poles and had taken two of them down when an injunction from the circuit court was served upon them.

Practical Questions and Answers

Switchboard Trouble Due to Loose Jacks.

We have a switchboard trouble which seems peculiar. When we put either one of a certain pair of plugs into No. 14 (a commercial wire 14 miles long) we can hear on every line that is plugged on the board. When we ring on either of the plugs, No. 10 drop, connected to a party line about 10 miles long, is thrown. Lines 10 and 14 have no connection whatever; one runs north and the other south. The trouble is experienced only occasionally; perhaps three or four days a month. If we touch any metal on the drops with the tips of these plugs we can hear the No. 14 line. Our board is a 100-drop American Electric Bell-Express, drops wound to about 900 ohms. When the trouble is on we can talk plainly from one line to the other, but if the plug is raised in the jack it will cure the defect for a time. The plug holes in the jacks are slightly worn so that the plugs raise 3-16 of an inch at the outer end.

In the board to which you refer the combined drop and jack are arranged as shown in Fig. 1. The tube or shell of the drop

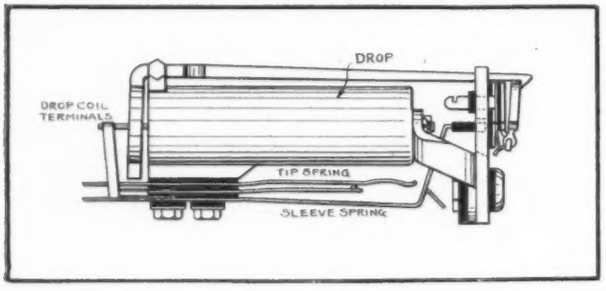


Fig. 1.

is immediately above the tip spring. The wearing away of the plugs and jacks allows too much play. When the plug is inserted in the jack, the weight of the cord pulls down on the outer end, lifting the inner end. This forces the tip spring against the iron tube of the drop, which is grounded on the framework which supports it.

You doubtless run the subscriber lines to the tips of the jacks, grounding the sleeves, hence this tilting of the plug crosses the line through the frame. Your remedy will be to get new sleeve bushings for the jacks, or arrange to insulate the tip spring so that it cannot touch the drop.

Where to Put Dry Cells on a Desk Set.

What is the proper disposition of the dry cells used on magneto desk sets? We have had some difficulty in finding suitable places, as there are not always available closets, shelves, etc., for our use.

It often requires considerable ingenuity on the part of the installer to arrange all the parts of a desk set in a neat and workmanlike manner. General rules are not easily formulated. The old manner was to put dry cells in the nearest closet, on some shelf, either in the desk itself, or on a nearby wall. In some cases the battery has been located under the floor. Where the proper support is available, many men tie the cells together and hang them on a nail or screw. The latter practice is not good, since it brings the zinc elements of the cells close together, and if there is even a little dampness one or more of them are likely to become partly short-circuited. If possible, keep the parts of the set together on the desk. There is usually

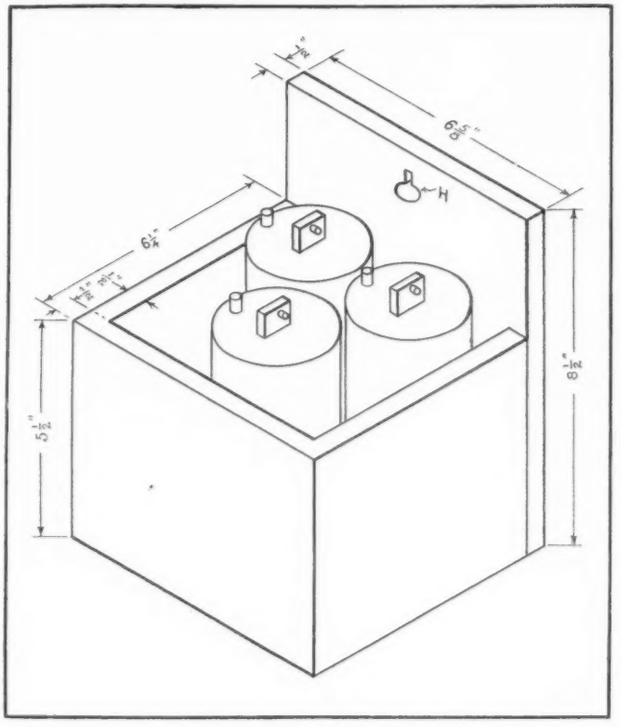


Fig. 2.

room enough under the center of the desk in the place known as the foot-space. The best device we have seen is to use a shallow box, just large enough to hold three cells. Its form is indicated in Fig. 2. Let the inside dimensions be about 5½ ins. square. The back will extend up above the tops of the cells, and a hole is made, through which a supporting hook, or screw, may pass. The box is so shaped that it can be unhooked and taken out for inspection without removing the cells. Of course the connecting wir nust be left long enough for this purpose.

The safety of . cells and the ease with which inspections, tests, and renewals can be made will more than repay the slight cost of this box, and it is adaptable to many places where other means of support are awkward or impossible. Neat metal boxes may now be obtained from dealers, and will be somewhat better, though the cost is higher.

Telephone News

Mayor of Marshalltown Signs Franchise for New Independent System.

After it had signed a contract with the city to expend $50,000 in 1909, Mayor Ingledue, of Marshalltown, Ia., approved on Sept. 28 the new ordinance granting a franchise to the Farmers' & Merchants' Telephone Company. The company then filed its articles of incorporation, fixing its capital stock at $250,000, divided into $100,000 common and $150,000 preferred. The officers of the company are: President, B. F. Cummings, Marshalltown; vice president, E. H. Martin, Webster City; secretary, P. C. Holdoegel, Rockwell City; treasurer, J. P. Cooper, Marshalltown.

San Francisco Supervisors Refuse to Attack Home Telephone Franchise.

By their action in refusing to request the attorney general of California to bring suit in the name of the state to test the validity of the franchise of the Home Telephone Company, the Board of Supervisors of San Francisco have closed one of the most vigorous legal struggles which has ever been inaugurated to oppose the advent of a new public service corporation to compete with an established rival. TELEPHONY's special correspondent in San Francisco in forwarding the announcement of this decision, supplies also information which makes it possible to trace with some

clearness the steps in the remarkable train of proceedings which have led up to the vote of the supervisors which is expected to bring about the closing of this litigation.

Early in 1905 Dr. Ferdinand Butterfield and his associates made application to the then Board of Supervisors for permission to submit a bid for a competitive telephone franchise. This Board of Supervisors was what was known as the "Last Phelan Board" and was constituted of reputable citizens. After some six months of work, the Home Telephone Company, a local corporation, whose organizers, however, were closely identified with the company of the same name in Los Angeles, also commenced to interest themselves in having a franchise offered for sale. The two interests, Butterfield and Home Telephone, having in common the object of submission of such an ordinance did not come in conflict at that time, but both worked in harmony. The effort failed, however, as the board declared itself to be opposed to the idea of competitive telephone service.

The so-called Schmitz Board of Supervisors came into existence early in January, 1906, and shortly thereafter a committee of the new board recommended the granting and sale of a telephone franchise. The ordinance adopted provided that the franchise would be open for competitive bids on April 23, 1906, at the city hall.

On Wednesday, April 18, the historic earthquake visited the city, and the ensuing fire continued for four days. On April 22, eleven out of the 18 members of the Board met and agreed to hold a regular meeting of the Board on April 23. At this time there was almost a complete cessation of business, legal holidays were being proclaimed by the governor and the official newspaper in which notices were required to be printed, had suspended publication.

However, this meeting of the board was held on April 23 to consider the competitive bids for this franchise. Only one bid, that of the Home Telephone Company, offering $25,000 for the franchise was received. After some discussion as to whether they should proceed, an oral resolution was adopted by a vote of 8 to 6, accepting the bid of the Home Telephone Company and the franchise was struck off on that bid to that company. This action at a subsequent meeting was ratified by a vote of 11 to 6.

At this time the first attempt was made by Dr. Butterfield and associates to indirectly attack the franchise. A direct attack was also made by quo warranto proceedings in the Superior Court. In pursuance of a legislative act, extending the time of legal action, Dr. Butterfield on July 9, 1906, presented to the Board of Supervisors a closed bid accompanied by a check for $27,000, bidding for the franchise. The supervisors refused to accept or consider this offer.

Then the action in the Superior Court was tried in September, 1906, and Judge Kerrigan handed down a decree in the following January, holding that the plaintiff, Hugo K. Asher, who was and is an attorney for Dr. Butterfield, was not entitled to any judgment in the case. The city was the defendant, the attack being made on the technicalities involved in the awards of the franchise during the holidays, without due notice of change of meeting place, etc. No appeal has been taken from this decision and it is claimed by the Home company's representatives that the time for appeal has passed.

No further steps were taken by the Butterfield interests until the exposures were made in connection with the prosecution of the graft cases arising from the Schmitz regime.

A petition was then filed with the Attorney General by Dr. Butterfield, the petition being known as the Agar petition, requesting him to grant leave to bring quo warranto proceedings in the name of the state to test the validity of the franchise, the claim being set up that in the previous action before Judge Kerrigan the real issues had not been gone into. The Attorney General kept the matter under advisement for several months and finally decided that he would not entertain it direct, but stated that as the city was a party in interest, he might grant the leave if the city made the request.

Thereupon the Board of Supervisors was petitioned to take the matter up and reply to the Attorney General so that the validity of the franchise could be tested in the state courts. This attempt to reopen the case after the Superior Court had handed down its decision that the franchise was valid was finally disposed of on Sept. 14, the Board by a vote of 10 to 7 declining to make the request of the Attorney General. In this hearing before the Supervisors Attorneys Matt I. S. Sullivan, Geo. W. Lane and Hugo K. Asher appeared for the petitioner and Attorney William Thomas of the firm of Thomas, Gerstle, Frick & Beedy, appeared for the Home Telephone Company.

Attorney Sullivan, in his argument, called particular attention to the fact that his clients stood ready and willing to make a bid of $750,000 for a franchise similar in terms to the one granted to the Home Telephone Company, provided that franchise was out of the way. He contended that the present Board of Supervisors was not sitting in a judicial capacity, but was, if it decided to grant the request of the petitioner, only voting that the whole matter be referred to the courts for determination and that, too, at no cost to the city.

Attorney Thomas spoke of the different actions that had been brought against his clients by Asher and Dr. Ferdinand Butterfield in an effort to have the Home franchise declared illegal. He pointed out that under the terms of the franchise the company was required to complete its plant in January, 1910. This he said gave the company three years in which to install its plant and required the expenditure of about two million dollars during the first year, and a million each during the second and third years.

"Our money to do this work," said Mr. Thomas, "is coming from outside places. These suits hamper us and make it more difficult to secure capital. So far as I am able to determine, there is no means by which our time to complete the work may be extended, and if suits are brought that will tie us up we and the city as well will be losers—we through our money loss and the city through the manner in which it discourages outside capital to develop industries and carry on enterprises. On the part of the company I represent we have repeatedly denied any bribery on our part, and those who are now attempting to hamper us would make us the innocent sufferers for the wrongful act of some one over whom we never had control."

He also argued that in the event the franchise should be held to be illegal, and in support of its legality he offered the opinion of Dillon & Hubbard, the city would then have to repay the Home company for all the money it had expended under the franchise, which, up to the present time, is about $2,750,000.

The officials of the Home Telephone Company regard the matter as closed, and are continuing with the installation of its expensive plant.

An important side light is thrown on the situation by an opinion rendered by Dillon & Hubbard of New York, who, after reviewing the facts, hold that the ordinance granting the franchise is a valid one and that the franchise is legal.

Inasmuch as Dillon & Hubbard had passed upon the validity of the large issue of bonds which San Francisco has recently sold at a high premium, the Supervisors had this additional fact in mind in deciding not to take any action in this telephone franchise litigation that would be directly contradictory to the opinion of these same attorneys.

Leading Newspapers Publish Refutation of Attack on Independent Securities.

The Chicago Inter-Ocean of October 6 contains the following:

"Joseph B. Ware, of Chicago, secretary of the International Independent Telephone Association, who is in New York, comes back with a vigorous answer. Mr. Ware says:

"'This attack upon the growth of the Independent companies of the country is false and misleading. In the first place the circular fails to state that there are today in this country 12,045 telephone companies that are independent of the Bell monopoly.

"'If it were true that 114 have failed in the past five and one-half years, the percentage would still compare favorably with any other industry. It would be approximately 1 per cent.

"'Take our national banks, for instance; in the same period there have been fifty-eight failures out of a total of 6,283, or approximately 1 per cent. If we add the number of reorganizations and voluntary liquidations the percentage would be five and one-half as against our one.

"'As a matter of fact the list as made up is not only padded by the repetition of names, but also by the inclusion of re-organizations and also of companies that are absolutely sound. I note that one is listed as a failure that in the last six months earned a net profit of $131,795, or 11 per cent per annum on all outstanding stock, after deducting $30,000 as a cash reserve for depreciation.

"'This shows the character of the Bell circular, which fails to state that among their own subsidiary companies some 30 per cent have passed dividends. We have 1,000,000 more instruments in service than the Bell.'"

Later reports from various large cities show that this item has been extensively reproduced by the leading papers of the country.

Dallas Independent Company Granted Extension of Time for Construction.

The City of Dallas, Texas, has granted to the holders of the Independent telephone franchise, an extension of the time in which they may begin work. Under the terms of the ordinance, as passed, it was required that construction work should be started not later than October 9. The council, in granting this extension, stated that in view of the vote of the people in favor of the franchise, it was felt that the people wanted the new telephone system, and that a refusal to grant the extension would probably defeat the measure voted for by the people.

It is recognized that extensions of terms have been necessary in all lines of business, and that the new telephone enterprise should not be forced to meet conditions not imposed upon other corporations.

New Independent Toll Lines in Indiana.

The Lafayette Telephone Company, of Lafayette, Ind., has recently announced to the public the opening of new toll lines to Indianapolis, doubling the capacity for handling long distance business between the two cities. The Lafayette company has a large list of subscribers, and anticipates that a large amount of business will pass over the new circuit.

Stockholders Approve Plan for Leasing Ohio Properties.

The stockholders of both the Cuyahoga and United States Telephone Companies approved the plan of leasing their properties to a holding company to be organized for that purpose within a short time. The approval of the stockholders of the Citizens Telephone Company, of Columbus, was secured Oct. 2. Over 98 per cent of the stock of the United States Telephone Company and over 87 per cent of that of the Cuyahoga were voted in favor of the plan.

The lease in its final form will be submitted for approval on Nov. 10. The wording has been entrusted to Attorneys Kline, Tolles & Goff, of Cleveland; Clarence Brown, general counsel for the telephone companies, and Harry M. Daugherty, of Columbus, together with a committee, consisting of President James S. Brailey, Jr., E. W. Moore and Addison H. Hough. In the meantime the holding company will be incorporated and all the details of the matter will be worked out.

It is said that the operating offices of the leasing company will be located in Cleveland, while the executive offices will be in Columbus. C. Y. McVey, general manager of the United States and the Cuyahoga Telephone Companies, is slated for the management of the properties when they are combined under lease, it is said. E. R. Sharp or Frank A. Davis, of Columbus, will probably be the president. Both are interested in the new company.

The details of the project have all been given in recent issues of TELEPHONY. There will be a large deposit in one of the trust companies of Cleveland to guarantee the interest and dividends, as well as to insure proper maintenance and extensions to the present systems.

Texas Independent Convention in October.

October 26 is the date set for the annual convention of the Texas Independent Telephone Association.

The committee has arranged an interesting program, covering the most important questions which can confront the Texas Independent telephone people, and every part of the state is represented in the gentlemen who will discuss these subjects. However, by this program it is not intended that the meeting shall be a cut-and-dried affair, but every man who attends is especially invited to come prepared to discuss these subjects in the five-minute talks which will follow each number, and also to bring up any new question not mentioned in the program, and any other matter which is of interest.

Following is the program:

Forenoon Session—9 a. m.

Roll-call of members.

Minutes of last meeting.

President's annual address, J. B. Earle, Waco.

"Why We Should Have a State Association," by C. A. Shock, Sherman.

Appointment of committees.

"Effect of Texas Officials' Views of the Anti-Pass and Anti-Trust Laws on Telephone Development in Texas," by T. P. Stilwell, Lone Oak.

Reports of officers.

"Toll Lines and Their Earning Power in Texas," by J. C. Casler, Dallas.

"Exchange and Toll Line Construction," by C. B. Luck, Fort Worth.

"Relation of the Exchange Owner to the Manufacturer and Supply Dealer," by C. W. Emmer, Beaumont.

Report of delegate to the International convention, T. A. Gould, Ennis.

"Telephone Advertising," by C. W. Roberts, Abilene.

Afternoon Session, 1:30 p. m.

"How to Increase Income and Curtail Expenses," by E. M. Chamberlain, Greenville.

"Rural Lines and Connections," by W. P. Johnson, Corsicana.

"Future Telephone Legislation," by D. C. Smith, Austin.

"The Future of Independent Telephony in the Panhandle," by C. S. Morris, Dalhart.

"Toll Lines in the Mountains," by J. H. Morgan, El Paso.

"An Exchange Without Toll Lines," by Tom Sargeant, Shreveport.

Reports of committees.

"The Value of Tact in the Telephone Field," by Floyd R. Brown.

Election of officers.

Sioux Falls, South Dakota, Company Purchased by Strong Independent Interests.

At the sale of the property of the Sioux Falls, S. D., Citizens' Telephone Company, the bidders were the New State Telephone Company, of Iowa, the Northwestern Telephone Exchange Company (Bell), and the Dakota Central Telephone Company of Aberdeen, S. D.

The plant was bid in by the New State Telephone Company, one of the strongest Independent companies in Iowa, for $94,700. The system purchased has about 1800 telephones. It is understood that a large amount of money will be immediately spent in putting the plant in first class condition. Toll lines already built connect this exchange with the system of the New State company.

New Move in Louisville Telephone Rate Struggle.

Although the ordinance providing new rates for the Louisville Home Telephone Company will come up in the courts, on a question of its validity, about the middle of October, there is now talk of introducing in the council a new ordinance to regulate telephone rates.

The city attorney has recently announced that the mayor will take this matter up, and it is said that he will endeavor to adjust matters in a way which will be entirely equitable, and leave no question of legality. The rate question for both the Bell and the Independent companies in Louisville, has long been somewhat of a troubled question, and further developments will not be without their features of interest.

South Dakota Legislators Looking Up Telephone Business.

It is reported from South Dakota that the legislature is planning to look into the telephone business to a considerable extent during the coming session. In this state the legislature has in the past shown a disposition to consider bills which are believed, in nearly all quarters, to be of a character which is far from beneficial to the telephone business.

Telephone managers and stockholders throughout the state will probably find it to their advantage to get in touch with their representatives, or the candidates at the earliest opportunity, and give them such information as is necessary to enable them to have a clear and correct understanding of telephone conditions, in order to avoid the passage of dangerous measures at the coming session.

Death of A. M. Bullard.

Albert M. Bullard, whose skillful work in developing telephone apparatus is generally familiar throughout the field, died Sept. 19, 1908. Mr. Bullard was born in Boston, Jan. 6, 1868. He was educated in the Boston public schools and received his technical training at the Massachusetts Institute of Technology. While in the service of the Thomson-Houston Company at Lynn, he was brought into personal relationship with Professor Elihu Thomson, who assigned him the task of developing the art of electric welding on lines laid out by Professor Thomson. In various cities in this country and for a year in Europe he was engineer for the Electric Welding Company.

Associating himself with the Chicago Telephone Company in 1896 he found opportunity for congenial work on electrical and mechanical problems. Among his inventions the "return coin" device, now in general use throughout the United States, is perhaps the best known, but his more important contributions to the art were made since 1900, while in the service of the American Bell Company in Boston and the Western Electric Company in New York.

Mr. Bullard married in 1904, Marian Rorty, sister of Malcolm C. Rorty, General Commercial Superintendent of The Central District & Printing Telegraph Company.

The composer, Frederic Field Bullard, who died in 1904, was his elder brother.

Telephone Construction by Winnipeg Municipalities.

At the present time, local telephone systems are being built for the following municipalities in Manitoba: Wallace, Woodworth, Pipestone, Miniota, Brenda, Morton, Macdonald, Argyle, Strathcona, Hamiota. The systems will be owned by the municipalities, and are being constructed under the laws of the Province which permit such ownership and provide for the furnishing certain assistance to the municipalities by the provincial government. The construction work is being done to conform to standards set in the specifications of the Provincial Telephone Department.

Iowa May Have Public Utilities Law.

Reports from Iowa continue to deal with the possibility of the passage of a public utilities law in that state, which will bear upon the same points touched upon in the laws of New York and Wisconsin. It is even stated that certain interests are at work preparing a draft of a bill to be submitted to the legislature at its next session.

Strong Advertising Material from Erie, Pa.

The Mutual Telephone Company, of Erie, has built itself up from a small start to a position of leadership in the territory occupied by its system. Part of its success, aside from that due to furnishing good service, results from its lively methods of going after business. An example is a circular, the back cover of which is reproduced herewith.

The front cover carries the legend "Something for Nothing?" bearing on a free service proposition advanced by a competitor, and leading to the following text printed within the cover:

"When an agent calls at the door and proposes to make you a present of something at no expense whatever, your

REMEMBER
WE REACH THE PEOPLE
WE SAVE YOU MONEY
WE BELONG TO ERIE
WE BROUGHT DOWN THE RATES
OUR SERVICE IS THE BEST
OUR RATES ARE THE LOWEST

A Sample of Circular Advertising.

suspicions are at once aroused. Somebody has to bear the expense, and it is certain that if you accept his gift, you will be the one who, in the end, pays for it.

"The Mutual Telephone Company has never been driven to the extremity of giving 'free' telephones in order to increase its list of subscribers. It has been in the lead for many years.

"Notwithstanding the fact that many of the telephones in the city have been placed 'on trial' and are in service only for a short time—notwithstanding this, today 80 per cent, *or four out of every five of the people who have telephones* can be reached over the MUTUAL company's lines."

Pioneer Telephone Company's Rate Troubles in Oklahoma.

The hearing on the Guthrie injunction case against the Pioneer Telephone & Telegraph Company has been continued in the district court by agreement until November 10. The city seeks to permanently restrain the telephone company from raising its rates on the grounds that the franchise, under which the company is operating is an agreement entered into

between the two parties, and that under the terms of the same, the company would forfeit its franchise or charter if the raise be made, as the company is now charging all that the franchise authorizes.

In November the court will pass upon the legal question raised regarding the franchise or ordinance being a contract, and should it sustain the contention made by the city, the case now pending before the Corporation Commission in which the city asks the commission to issue an order requiring the telephone company to put back into effect the old rates, would be dismissed for want of jurisdiction in the matter by the commission and the final determination of the case would be made by the courts.

If the court would hold to the contrary, the complaint with the commission would be renewed and a lengthy investigation and hearing would be conducted by the commission, in which they will go into detail as to the cost of operation, having experts from other states to compare the Oklahoma service with that of other states as to the service rendered for the money.

The case, however, will be made a test case in either event by the Pioneer Telephone Company by appealing to the Supreme Court.

The trouble in Guthrie started when on August 1, 1908, the telephone company served notice on its customers that on and after September 1 the rates would be increased from $1.50 to $2.00 for residence telephones, and from $2.00 to $2.50 and $3.00 for office telepones. Complaint was immediately filed by the city before the Corporation Commission. When the company began to collect the new rates in advance on September 1, the city attorney secured a temporary injunction from the district judge, restraining the collection of any other rates than the old ones. Two weeks ago the company served notice that it would, after October 1, charge $1 for extension telephones instead of $0.75. City Attorney Green at once secured a restraining order from the court against this raise until the hearing on November 10.

The Corporation Commission has heard and determined but one complaint filed against the raising of rates since its organization last November. This was the Enid case where the merchants refused to pay the raise demanded by the Pioneer Telephone & Telegraph Company. The commission conducted a nine days' hearing, and sixty days ago issued an order requiring the old rate to be put back in effect. The telephone company took an appeal from this decision to the Supreme Court and is now charging the new rate. It was compelled, however, to put up a $10,000 bond by the commission to cover the refund should the Supreme Court sustain the commission's ruling. The commission recently conducted a hearing at Krebs on a complaint filed by the citizens of that town alleging discrimination in rates and an unjust raise by the Pioneer Telephone Company. The court has taken the matter under advisement and it is thought that no decision will be made until after the Guthrie and Enid cases are finally disposed of.

Two weeks ago the citizens of Bartlesville were served notice by the Pioneer company of a raise in rate similar to the ones made at Enid and at Guthrie. The district court of Tulsa County has issued an order against the company restraining the collection of the new rates pending the final disposition of the test cases before the Corporation Commission.

Telephone Patents

TRANSMITTER CUT-OUT.

H. S. Gilbert and W. F. Drake, Pueblo, Col., patent 899,524, Sept. 29, 1908.

A cut-out switch for telephones is covered by this patent. Usually these switches are provided on the transmitter, and take two hands to operate, one to hold the receiver and one to actuate the cut-out button. In this invention the transmitter terminals are connected to a flexible cord, the terminals of which are firmly clamped to the edge of the receiver cap, so that any person using the receiver when telephoning can place his thumb on the spring and thus cut-out the transmitter.

FLEXIBLE CORD.

G. F. Atwood, East Orange, N. J., patent 896,700, Aug. 25, 1908.

This invention is designed to provide a stronger flexible cord for telephone work. An iron core which runs practically the full length of the cord, or at least between its mounting points, ends in two tips, which are fastened to the pieces of apparatus between which the cord is used. Around the iron core a silk insulation is placed, then waterproof covering and next a metallic conductor and so on, the flexible cord in this instance having triple conductors.

TELEPHONE APPLIANCES.

C. A. Wardner, Brushton, N. Y., patent 899,641, Sept. 29, 1908.

A scheme for placing a number of receivers in multiple with a circuit and connecting a plurality of transmitters to this circuit is described in this invention. These transmitters can then be operated by various sound producing instruments, and a joint effect of the plurality of transmitters is had on the line which actuates the receivers.

These sound producing instruments are operated by performers, and each one of these performers can be provided with a transmitter ,and also a receiver, so that all the performers will be in intercommunication and can therefore regulate and time their individual productions to harmonize with those of the others, and thus produce on the subscribers' line the same harmonious effect that is produced by the individual members of a band or orchestra.

TELEPHONE MEMORANDUM PAD.

E. J. Casey, Chicago, Ill., patent 898,553, Sept. 15, 1908.

This patent covers a special pad, which can be readily attached to the transmitter. The pad has a number of blank sheets, which are pivoted at one corner. A spring slipped around the transmitter head is attached to the heavy back of the pad thus supporting it in a convenient position for use.

PHONOGRAPH ATTACHMENT FOR TELEPHONES.

A. Hatchett, Louisville, Ky., patent 898,642, Sept. 15, 1908.

This invention is designed to provide a phonograph for attachment to telephone instruments, so that if the subscriber is not at home a record may be taken of the message which can be repeated to the subscriber upon his return.

CARBON ELECTRODES.

F. B. Cook, Chicago, Ill., patent 896,802, Aug. 25, 1908.

This invention relates to the ordinary form of grooved carbon electrodes for lightning arresters. The carbons are treated on their engaging surfaces with a non-conducting adhesive material, preferably a cement, the body of which is celluloid, which is applied so as to merely fill up the indentures or low places in the surfaces, and leave the high points exposed. This provides a smooth active surface for each electrode, which has no indenture to collect or hold carbon dust or other foreign parti-

cles, and at the same time it has a great number of exposed points from which the discharges can take place.

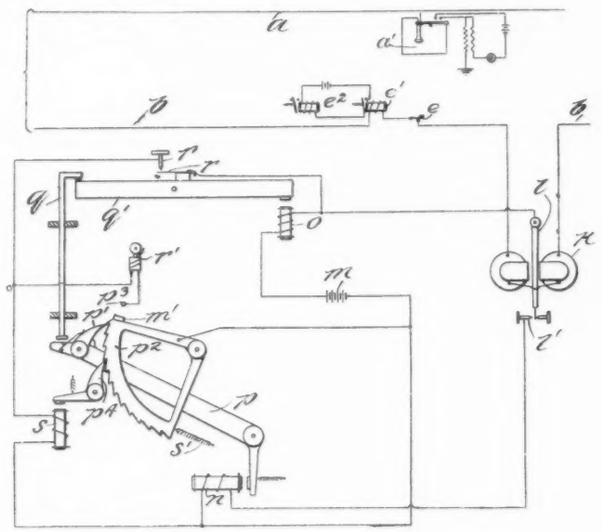
This coating does not form a dielectric to hold the electrodes out of electrical connection with each other, and therefore does not require a materially higher voltage to arc through, than through a similar arrester which is not treated.

The coating being in the form of a cement holds the particles of the carbon electrodes together, and prevents them from becoming loose.

SELECTIVE SIGNALING SYSTEM.

Harry O. Rugh, Sandwich, Ill., patent 899,564, Sept. 29, 1908.

This patent relates to a selective signaling system wherein it is designed to call any one of a plurality of stations. The line wire *b*, in addition to being provided with telegraph apparatus *c* and *e'*, has a polar relay *k*, which is designed to connect a telephone instrument to the line wire *b*. When the polar relay *k* is operated by intermittent current, each impulse operates the relay *n*, which steps up the mechanism p^2 to the required angular displacement, so that it can close the circuit through the ball *r'*. This circuit, however, is not completed until a short time after this contact at the contact points *m'* and p^3 is made, by reason of the slow acting lever *q'*. Thus rapidly following impulses will step up the mechanism, and even though it closes the con-



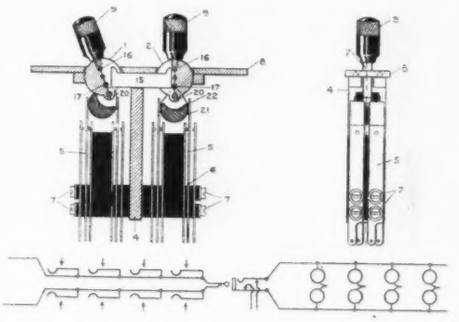
tacts to the bell temporarily, the bell *r'* will not operate until a certain time interval has elapsed to give the lever *q'* a chance to operate. Thus when the desired station has been connected, the current is left on, the polar relay for some time, thus releasing the lever *q'* through the elevation of the arm *q*, and this slow-acting lever *q'* rotates, closing the contact at *r* to permit current to flow to the bell *r'* to operate same.

PARTY LINE INDICATING KEY.

Clifford C. Bradbury, Chicago, Ill., Patent 899,379, Sept. 22, 1908.

This patent covers a party line indicating key which is used for 4-party line service on telephone switchboards. Its application is clearly apparent from the circuit diagram where there are four various ringing positions. These four various ringing positions are to be occupied by the two levers, 9, 9, each lever capable of occupying two positions. Rubber levers are directly associated with a circular oscillating-like disc deviating at its central point, and on each of the discs are mounted pins, 16 and 17. Between the two discs there is mounted a plate, 15, which when in the position shown in the illustration, will permit the key, 9, to occupy either of its alternative positions. The key lever, 9, as indicated, is in its completed ringing position.

A further movement of the lever in the direction in which it is pointed, will actuate its ringing springs which lie next to the strip, 4. In case it is desired to actuate its ringing springs at the left side of the key, the lever, 9, would be reversed in its position, this being permitted by the plate, 15, in its present



position. The key, 9, would then maintain a position to the right of its central line. The same is true of the lever, 9, it is actuated in either direction. The pins, 16 and 17, push the plate, 15, to the left so that key lever, 9, is placed in its vertical position and the key lever, 9, to the right of the key maintains its indicating position either to the right or to the left.

SUBSTATION PROTECTOR.

F. B. Cook, Chicago, Ill., patent 897,590, Sept. 1, 1908.

This invention relates to a substation protector unit, having a flat porcelain base with two fuses mounted thereon, running parallel to the sides of the base. The base is provided with a recess between the fuses and near one end. A projecting wall increases the depth of the recess without thickening the body of the base.

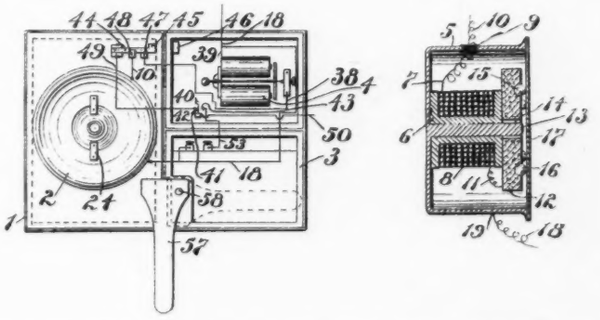
A pair of lightning arresters are located within the recess, and engage a pair of spring members, which also form the terminals for one end of the fuses, these springs projecting through slots in the recess.

There is also another set of spring members which hold the lightning arresters which form the ground connection. The recess is provided with a cap and suitable binding posts are mounted on the base for connecting purposes.

PORTABLE TELEPHONE.

Frederick F. Strong, Boston, Mass., patent 898,699, Sept. 15, 1908.

A portable telephone outfit small enough to be carried in the pocket is covered by this invention. One of its features consists in providing a combination transmitter and receiver, which are mounted in a casing 5, having a diaphragm 17. An iron core,



15, is provided with a receiver winding, 8, which when actuated, operates the diaphragm 17. The diaphragm serves at the same time as the transmitter in that it rests against balls 16-17, which are mounted in recesses in a carbon plate 14. It is designed to place this combination outfit in a box 1, which also holds a small battery 3, and a ringer 4.

In the Manufacturing Field

Telephone Service at the New York State Fair.

At the New York State Fair, held at Syracuse, Sept. 14 to 17, the Stromberg-Carlson Telephone Manufacturing Company was represented with a telephone exhibit in charge of Mr. F. C. Redfield. The exhibit was in conjunction with the telephone service given to all exhibitors in the various departments on the fair ground by the Onondaga Telephone Company, which operated a Stromberg-Carlson two-position lamp line signal switchboard.

Two operators were kept constantly busy throughout the entire week in handling the Independent toll line service, which was a telephone feature of this fair. Direct results were received by the Stromberg-Carlson Company from this exhibit in the form of several orders from new customers, and many favorable comments were given the Onondaga Telephone Company for providing such acceptable service. The Bell company was not permitted in the grounds and had only three pay stations on the premises.

W. J. Stanton.

The Homer Roberts Telephone Company has just announced that Mr. W. J. Stanton has joined its staff, and will have important duties in the sales department. This announcement will be read with particular interest in all parts of the field, as Mr. Stanton has not only held many positions of responsibility, but has formed a wide acquaintance and won a most deserved and extensive popularity among telephone men in the central West.

He first worked at the telephone business during vacations, between college terms, and, in these intervals, was employed by various companies filling positions from that of groundman to general manager. Leaving college, he purchased and rebuilt a small exchange at Conrad, Ia. The results obtained here attracted the attention of the officers of the newly organized Corn Belt Telephone Company of Waterloo, Ia., which is one of the largest operating companies in the West, and, for two years, he successfully carried on the duties of superintending engineer of this organization. In 1906, he resigned this position

Mr. W. J. Stanton.

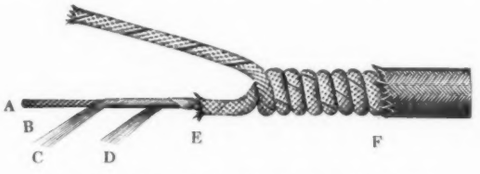
to take up work with the American Electric Telephone Company, of Chicago, as sales engineer, and went from this position about a year later into the service of the Dean Electric Company at Elyria, Ohio. He now becomes associated with the Homer Roberts company, of Chicago, the sales of whose selective lockout party line system are being so extensively pushed.

By these various changes, Mr. Stanton has made himself familiar with the telephone business from all points of view, and the growth of his experience has been accompanied by a steady advance in responsibility and opportunity which has caused his many friends to forward him hearty congratulations on his latest success.

Switchboard Cords.

In making a telephone switchboard cord, manufacturers are compelled to use relatively weak material for various reasons such as space, weight and flexibility.

If the cord could be constructed as solid and reliable as practically all the other parts of the telephone circuit, the



Construction of the Steel Conductor Cord.

service from a transmission standpoint could be materially improved, and maintenance considerably reduced.

It was at one time the general practice to make the conductors of switchboard cords of either copper or brass tinsel threads, forming the threads into either a braid or spiral rope formation, and insulating the various conductors with silk and cotton. The conductors would then be encased in a spring brass wire helix over which a braid of linen or cotton thread was placed.

Owing to the rough usage the cords generally received at the hands of operators, the tinsel conductors were injured more or less at the point where the cords enters the plug, and this was the main cause of so-called "noisy cords."

For some time past cords have been manufactured using steel conductors instead of tinsel and a cord of this type which is having a large sale is shown in the accompanying illustration.

The conductor *A B* consists of a specially prepared steel wire which is very flexible and durable. A winding of fine copper wire is applied directly over the steel wire, thus reducing the resistance to a minimum. The insulation *C D* is made up of a layer of silk and two layers of cotton wound in reverse directions. A cotton braid treated with a special wax is then placed on the conductor. Both conductors are formed into a concentric helix over which is a braid of cotton.

For the purpose of reinforcing the cord at the end subject to greatest usage, a spring, made of high grade steel, is inserted in the hollow of the cord at the plug end. This prevents the conductors from being thrown out of alignment making it almost impossible to break the conductors. The outside insulation of the cord is reinforced at the plug end by a double braiding of linen thread.

This cord, known as the "Premier' steel conductor cord, is manufactured by the Runzel-Lenz Electric Manufacturing Company, 101 So. Clinton St., Chicago, Ill.

THE MASSACHUSETTS CHEMICAL COMPANY is building a new addition to its factory at Walpole, Mass., comprising some 15,000 square feet of floor space, to accommodate the tape department, which has entirely outgrown its present quarters. The tapes manufactured by this company have been for many years well and favorably known for their high initial and permanent quality. The line of friction tapes, especially, exhibits all the essentials of a high-class modern insulating product, viz., lasting quality, chemical neutrality, adhesiveness, and moist-

ure-proof quality. These features—which may be expressed in the single word permanence—enable this product to meet the most exacting requirements as to temperature changes and exposure to deteriorating influences, and make the factor of insulation as definite and determinable as any other factor in the construction or installation of electrical apparatus.

Printing for Telephone Companies.

Telephone companies have a good deal of printing done during a year and, as printers throughout the country are realizing the fact, some of them pay special attention to this class of printing.

One of the large firms which makes a specialty of printing for telephone companies is the Mirror Printing Company, of Albion, Mich. This company was established in 1855, and in March of last year was incorporated under the Michigan laws. At that time a great deal of machinery was installed for the special purpose of enabling the company to take care of the increasing demand for forms used by telephone companies.

Mr. K. W. Lambooy, general manager, has devoted considerable time to telephone printing, and his business-like methods have made for him many friends among the telephone men. All orders are carefully and promptly filled,

Mr. K. W. Lambooy in His Private Office.

and rush orders are especially well handled. The company states that toll tickets can be shipped on twenty-four hours notice.

Catalogue No. 8, a descriptive price list, has just been issued. Samples of standard toll tickets are shown, as are also the various error system forms and other forms used by telephone companies.

Newest Protector Orders.

The following orders for central office and substation protectors are reported by Frank B. Cook, 240 West Lake street, Chicago, as having recently been received:

Arkadelphia, Ark., 3 terminals and J. B.; Richmond, Ind., 100 pairs additional frame; Laingsburg, Mich., 3 T-19; Plymouth, Ind., 3 J. B.; Giltner, Neb., 4 J. B. and terminal, 200 No. 10 protectors; Waynesburg, Ohio, 1 J. B. and 2 terminals; Oakland, Cal., 10 S-8; York, Neb., 100 No. 10 addition; University Place, Neb., 100 No. 10 addition; Wallace, Idaho, 200 No. 20, 88 J. B. and terminals; Maple Creek, Sask., Canada, 11 J. B. and terminals, 200 No. 10; Billings, Mont., 100 No. 10 addition; Boone, Ia., 4 terminals; Havelock, Neb., 20 J. B. and terminals; Woodward, Okla., 400 No. 10; Detroit, Mich., 1000 B-7; De Land, Fla., 17 J. B. and terminals; Mt. Pleasant, Ia., 8 J. B. and terminals; Elyria, Ohio, 10 terminals; Johnstown, Pa., 6 terminals; United States Government, 100 No. 8, 15 terminals; Wellsburg, W. Va., 300 No. 10; Charlestown, W. Va., 20 terminals; Dallas, Tex., 12 terminals; Oakland, Cal., 10 terminals; Seattle, Wash., 24 terminals; Plymouth, Ind., 9 J. B. and terminals; Greenfield, Mo., 6 terminals; Hereford, Tex., 2 J. B. and terminals; Sabetha, Kan., 3 terminals; Perry, Ia., 30 terminals; Adel, Ia., 4 terminals; Richmond, Ind., 100 No. 10; Cameron, Mo., 14 J. B. and terminals; Butler, Ind., 400 No. 10; Hiawatha, Kan., 17 terminals; Norwich, N. Y., 360 No. 14; War Department, 4 terminals; Eldorado, Kan., 2 J. B. and terminals; Osawatomie, Kan., 100 No. 10; Elyria, Ohio, 1160 No. 10; Lemmon, S. D., 100 No. 10, 9 terminals; Plano, Ill., 4 J. B. and terminals; Sononauk, Ill., 5 J. B. and terminals; Anaconda, Mont., 15 terminals; Manila, P. I., 24 terminals; Booneville, Mo., 100 No. 10, 84 terminals; Delaware, Ohio, 6 terminals; Lincoln, Neb., 21 terminals; Enderlin, N. D., 5 terminals and 200 No. 10; Miltonville, Kan., 5 J. B. and terminals and 200 pairs frame; Lebanon, Ky., 21 terminals; Lone Wolf, Okla., 3 J. B. and terminals; Cedar Rapids, Ia., 8 terminals; Tonopah, Nev., 400 pairs frame; Canadian, Tex., 5 terminals; Windber, Pa., 7 terminals; Delaware, Ohio, 1 S-6 and 1 J. B. and S-6; Harrisburg, Pa., 1000 B-7; Reading, Pa., 20 No. 44; New Holland, Ohio, 3 J. B. and S-6, 2 S-6 and 1 J. B. and 200 pairs frame; Cadiz, Ohio, 400 No. 10, 35 M-4 and 9 S-6; Omaha, Neb., 50 S-10; Richmond, Ind., 150 No. 10; Marshalltown, Ia., 2000 pairs frame; Aberdeen, S. D., 100 B-4; Lemmon, S. D., 7 S-6; Alliance, Neb., 100 No. 10 additional; Plainview, Tex., 400 No. 10; St. Louis, Mo., 10 S-12; Worcester, Ohio, 20 T-4; Grand Island, Neb., 6 S. M. and 1 J. B. and S. M.; Amarillo, Tex., 1440 pairs intermediate frame; Pawnee, Neb., 39 S-6; Crane, Mo., 3 terminals; Utica, N. Y., 100 B-7; Statesboro, Ga., 18 S. M.; Mapleton, Minn., 200 pairs frame; Winchester, Ind., 100 B-7; Dallas, Tex., 6 S. M.; Hillsboro, N. D., 300 pairs frame; Halifax, N. S., 200 I bolt clamps; Fayetteville, Ark., 3 T-5; Des Moines, Ia., 5 S-6; Topeka, Kan., 200 B-5; Lockport, N. Y., 13 S-6; Larned, Kan., 2 S-6; Decatur, Ill., 2700 No. 10; Hamilton, Ohio, 7 terminals; Woodard, Okla., 110 No. 10; Soammon, Kan., 9 terminals; Oregon, Wis., 4 terminals; Oswego, Ill., 5 terminals; Coeur d'Alene, Wash., 120 No. 20; Des Moines, Ia., 12 terminals; Council Bluffs, Ia., 4 terminals; Madison, Fla., 6 terminals; Elyria, Ohio, 50 terminals; Anson, Tex., 5 J. B. and terminals; Wellsburg, W. Va., 10 J. B. and terminals; United States Government, 500 No. 8-1; Duncombe, Ia., 4 terminals; Western Union Telegraph Co., 500,000 wire joints.

MR. J. A. KENNY, 1113 Monadnock Block, Chicago, will represent the C. A. Manufacturing Company of Austin, Tex., in Chicago and northern Illinois. Mr. Kenny will handle the company's well known C. A. wood preserver, "Carbolineum America."

MR. H. H. GERHARD, manager of the C. A. Manufacturing Company of Austin, Tex., has returned to Texas from a month's business trip to Minneapolis, Chicago, St. Louis and other points. He reports a growing demand among telephone companies for pole preservative.

MR. NORMAN FURST, formerly with the Missouri & Kansas Telephone Company at Kansas City, and later engaged in the sale of rebuilt telephone apparatus, is now representing the North Electric Company, still making his headquarters at Kansas City.

MR. PERCY EUBANKS of the Automatic Electric Company, has removed with his family to Boone, Iowa, where he will supervise the installation of the new automatic telephone system in that city.

Plans for This Winter's Electrical Show.

Probably electrical men throughout the country have by this time almost unanimously reached the conclusion that the Chicago Electrical Show is the greatest annual event in the business. It brings together, under one roof, the exhibits of all the manufacturers of electrical machinery and the various auxiliary devices used in electrically operated plants, and is the gathering place for the leading men from the operating and manufacturing companies throughout the entire country.

Although the show held in January, 1908, was only the third exhibition, the plans had been so thoroughly worked out by the directors and managing officers of the exposition company, that the features of attractive display, fair arrangement of exhibition space, and the arousing of outside interest, were taken care of in a manner which created most favorable comments among the various exhibitors, and the thousands of visitors to the show.

The exposition this winter is expected to be even larger and better than it was last year, and a considerable number of firms are already taking up with the management the questions of space and location for their exhibits.

It is now very generally anticipated that the coming spring will witness a great revival of business activities. The banks throughout the country have ample cash reserves, and many important projects are waiting for the outcome of the election to be announced. Business throughout the country in all lines is generally believed to be in a similar condition, so that the consumers of service furnished by the various electrical companies may be expected to increase in number, and amount of individual consumption of service, very materially within the next few months. It is these conditions, and the anticipation of a bright future, rather than a backward view of the somewhat clouded conditions of the past few months, which seem to be governing the attitude of exhibitors toward the forthcoming show. This not only applies to the electric light, power, and railway field, but most particularly to the telephone business, which should be one of the first to benefit by a decided improvement in general conditions.

The careful attention to detail, and fair regard for the interests of all intending exhibitors which was so thoroughly in evidence in previous shows, is assured in the exhibit planned for this winter, as it will be entirely under the control of the officers who have built up this great exposition to its present standing.

Mr. Homer E. Niesz will be in active charge of all arrangements, as managing director of the Electric Trades Exposition Company. The dates set for the show are January 16 to 30.

Brilliantly Illuminated Exhibits of the 1908 Chicago Electrical Show in the Coliseum.

The Long Distance Telephone Manufacturing Company, South Bend, Ind., has issued price list No. 35 of the large line of telephone apparatus which it manufactures. A circular has also been sent out, giving letters from various telephone companies throughout the country testifying to the satisfactory service obtained from the use of the company's "Long Distance" transmitter.

Condensed News Reports

Officers of companies are earnestly requested to forward us promptly all financial and other statements as soon as issued and any items of interest as to their plants and systems

PERSONAL.

MR. ROLLIN GOODWIN has been appointed manager of the Wisconsin Telephone Company's exchange at Genoa Junction.

MR. J. D. EDMONDS, for the past few years connected with the operating and sales departments of the Western Electric Company, Chicago, has been appointed superintendent of the Sterling Electric Company, LaFayette, Ind.

DR. C. J. H. WOODBURY, who is well known to telephone men from his contributions to the development of modern methods of protecting telephone exchanges against fire risks and other valuable work, has resumed practice as a consulting engineer, with offices at 45 Milk street, Boston, Mass.

While assistant engineer of the American Telephone & Telegraph Company, Dr. Woodbury's duties took him to many parts of the country, so that he is one of the best known of the men who have been prominent in the development of the art. His familiarity with the problems of fire protection is of a broad character, as he has also approached the subject from another side during his connection with the Factory Mutual Insurance Companies, where he was engineer before joining the staff of the American Telephone & Telegraph Company, and also from his connection with the National Association of Cotton Manufacturers, of which he is still secretary.

NEW COMPANIES.

GRAND BAY, ALA.—The Grand Bay and Union Telephone Company was recently organized at this place. The following officers have been elected: President, John Jagger; vice-president, Joe Stevens; secretary, M. A. Fort; treasurer, Albert Freeland; directors, Henry Brinkman and C. S. Hammond.

MODESTO, CAL.—Articles of incorporation have been filed by the Ceres Telephone Company with a capital stock of $9900. The principal place of business will be at Ceres. The directors are: J. T. Campbell, S. E. Foster of Modesto, Anthony Morgan, N. E. Taylor, J. B. Tupper of Ceres.

DAWSON, GA.—The Dawson Telephone Company of this place has applied for a charter. The directors are: J. H. Davis, W. A. Davidson, J. A. Gibson, J. A. Horley, Jr., W. F. Locke, B. M. Roberts, W. C. Paschal, S. R. Christy, W. R. Baldwin and others.

SPRINGFIELD, ILL.—The Ray, Rushville and Mutual Telephone Company of Rushville, Ill., has been incorporated to operate a telephone line between Ray and Rushville. The incorporators are: Henry G. Teel, Thomas Ashwood and H. B. Anderson.

AUGUSTA, ME.—The Equalized Telephone Association of Wesley has been incorporated with a capital stock of $10,000. The officers are: President, S. G. Day; treasurer, L. A. Gray; secretary, G. A. Day, all of Wesley.

BOSTCN, MASS.—The Rock Hill Telephone Company of Boston has been incorporated to carry on a telephone and telegraph business. The capital stock is $50,000 and the officers are: President, S. R. Smith; treasurer, T. Workman, Rock Hill, S. C.

ST. PAUL, MINN.—The Rollingstone Telephone Company of Rollingstone, Winona county, has been incorporated with a capital stock of $10,000. The incorporators are Henry Speitz, N. M. Reiland and Andrew Rinn, Jr., all of Rollingstone.

BENNINGTON, NEB.—The Farmers' Telephone Company of Bennington has been incorporated to operate and maintain a telephone line at Bennington. The capital stock is $1,000 and the incorporators are: Henry J. Wesemann and George T. Lodgemann.

CINCINNATI, OHIO.—The Eubank and Bethelridge Telephone Company, Pulaski county, Kentucky, has been incorporated. The incorporators are: T. J. Acton, of Pulaski county; Silas Wesley, of Bethelridge, and Otis Housan, of Eubank.

PORTLAND, ORE.—The Beaver Creek Mutual Telephone Association has been incorporated with a capital stock of $5,000. The principal office will be at Beaver Creek, Ore. The incorporators are: Fred Camrath, C. Moehnke, Jr., and C. E. Spence.

HARRISBURG, PA.—The Lost Creek Valley Telephone Company of McAllisterville, has been incorporated with a capital stock of $5,000. The incorporators are: A. J. Beyer, Miffin; H. J. Shallenberger, A. W. Kerr, McAllisterville, and others.

AUSTIN, TEX.—The Godley Independent Telephone Company of Godley, Johnson county, has been incorporated with a capital stock of $32,000. The incorporators are: J. B. Robertson, J. A. Dalton, C. D. Odom, J. R. Weaver.

HOUSTON, TEX.—The Howe Telephone Company of Grayson County has been incorporated with a capital stock of $2,500. The incorporators are: C. A. Shock, S. D. Donohue, R. S. Daugherty.

MARINETTE, WIS.—The Daggett-Nathan Telephone Company has filed an amendment of its incorporation papers, changing the name of the company to the Daggett-Nathan-Faithorn Telephone Company. The company is incorporated for $4,000.

BLENHEIM, ONT., CAN.—The Farmers' Long Distance Telephone Company has been incorporated here with a capital of $40,000. The incorporators are: N. Watson, M. H. Newcombe and J. Whittington.

TORONTO, ONT., CAN.—The Belton Telephone Company, Ltd., has been incorporated with a capital stock of $20,000.

TORONTO, ONT., CAN.—The Hechston Rural Telephone Company, Ltd., has been incorporated with a capital stock of $5,000.

FINANCIAL.

DAHLGREN, ILL.—The Dahlgren People's Telephone Company has increased its capital stock from $12,500 to $20,000.

INDIANAPOLIS, IND.—The Home Telephone Company of Crawfordsville has increased its capital stock from $15,000 to $100,000.

SOUTH BEND, IND.—The Home Telephone Company has declared a dividend of 3½ per cent on its preferred stock.

FARGO, N. D.—The Farmers Telephone Company of Cando has increased its capital stock from $10,000 to $25,000.

COLUMBUS, OHIO—The Galion Telephone Company has increased its capital stock from $100,000 to $125,000.

SANDUSKY, OHIO.—At a recent meeting of the directors of the Sandusky Telephone Company a dividend of 1 per cent was declared. Reports showed that during the past year there has been an increase of business, both in the number of subscribers and the receipts.

MILWAUKEE, WIS.—The Rockland Telephone Company, Rockland, Manitowoc county, has filed an amendment, increasing its capital from $1,500 to $3,000.

FRANCHISES.

DAWSON, GA.—The Dawson Telephone Company, which has applied for a charter, has filed an application before the city council for a franchise to construct a telephone system in this city.

CROOKSTON, MINN.—The Tri-State Telephone and Telegraph Company has been canvassing among the business men to obtain their views as regards the placing of long distance telephone booths in various parts of the city. In case this plan meets with favor, the company will apply to the city council for a franchise.

LEXINGTON, MO.—The Citizens Telephone Company of Higginsville has applied to the city council for permission to establish pay stations in Lexington.

STEWARTSVILLE, N. J.—The West Jersey Toll Line Telephone Company has applied for a franchise to construct a line from New Village to Shimers, passing through this place.

MANTZ, PA.—The Mahoning and Lizard Telephone Company of West Penn will apply for a charter to build a line from Tomaqua through Mahoning and Lizard Creek Valleys.

WASHINGTON, PA.—The National Telephone Company has applied for a franchise in East Washington.

KELSO, WASH.—The Northwestern Long Distance Telephone Company has applied for a tranchise in this place.

SPOKANE, WASH.—The county commissioners have granted the petition of N. O. Weyen for a franchise for the Espinola telephone line.

WASHOUGAL, WASH.—A franchise has been granted by the county commissioners for a period of 25 years.

CONSTRUCTION.

BIRMINGHAM, ALA.—The People's Home Telephone Company has just completed the installation of modern telephone equipment in its exchange at West End.

BAKERSFIELD, CAL.—Telephonic communication has been established with Maricopa, over the lines of the Kern Mutual telephone system. Connection was established some time ago with McKittrick. Mr. C. S. Garfield of the Kern Mutual system has established headquarters at Maricopa and will direct the new system from that place.

UNION, CAL.—It is reported that the Union Home Telephone & Telegraph Company will make many improvements in its system.

LINDALE, GA.—The Silver Creek Telephone Company's line was recently completed.

ELK CITY, IDAHO.—The Stites-Elk City Electric Light and Telephone Company will extend its telephone lines from Elk City to Orogrande and Dixie, work to be started within a short time.

FULTON, ILL.—Work is now in progress on the new cable system of the Tri-City Telephone Company. About 3000 ft. of cable will be used in this work.

METAMORA, ILL.—The farmers' telephone line out of this place is being improved.

WAVERLY, ILL.—The Waverly Telephone Company has just completed the construction of a line to Lowder.

WINCHESTER, ILL.—The Winchester Telephone Company is making preparations to equip its exchange with a new engine generator and storage battery. The equipment has already arrived and will be installed at once.

GOSHEN, IND.—The toll and rural lines of the Home telephone company are being overhauled and placed in first-class condition.

FONDA, IA.—The farmers in this vicinity are agitating the organization of a mutual telephone company.

MARATHON, IA.—Many improvements are being made in the local telephone exchange.

MASON CITY, IA.—The Western Electric Telephone Company is constructing toll lines to Lake Mills and Greene.

MENOMINEE, MICH.—The Daggett-Nathan Telephone Company will extend its lines to Faithorn.

CROOKSTON, MINN.—The Tri-State Telephone and Telegraph Company has men at work on a new line from this city to Morehead.

FLOYD LAKE, MINN.—Farmers in the vicinity of this place organized a telephone company at a recent meeting at E. E. Mercer's residence. Contracts were let for the construction of the line and work has already been commenced.

BUTLER, MO.—A new switchboard has been installed in the local telephone exchange.

CAMBRIDGE, NEB.—The Cambridge Telephone Company is making many improvements in its system. A new cable is to be strung and a new switchboard has been ordered.

HAVELOCK, NEB.—It is reported that work is to begin at once on the new Independent telephone building in this place. About $10,000 will be expended in the construction of the new Independent system.

QUESTA, N. M.—The Taos County Telegraph Company has completed its line into this place and proposes to extend it at once to San Luis, Colorado and to Red River.

GLOVERSVILLE, N. Y.—The Glen Telephone Company will install new switchboards in the Canajoharie and Fort Plain exchanges, and other improvements will be made.

HANCOCK, N. Y.—The Hancock Telephone Company is constructing a toll line to Deposit, and making other improvements in its system.

ITHACA, N. Y.—The Ithaca Telephone Company is building several new lines in the town of Newfield.

KING'S MOUNTAIN, N. C.—The Piedmont Telephone Company is making many improvements on its lines in this place.

LEONARD, N. D.—The old telephones on the farmers' telephone line have been removed and replaced with new ones, thus improving the service.

CLEVELAND, OHIO.—The United States Telephone Company recently opened its new Toledo-Detroit long distance circuits.

REYNOLDSBURG, OHIO.—The Franklin County Telephone Company has just completed a new toll line from this place to Canal Winchester.

JOHNSTOWN, PA.—The Central Telephone Company contemplates extending its lines from Shanksville to Colemans and Lambertsville in the near future.

LOCK HAVEN, PA.—The Nisbet Rural Telephone Company will run a line to Bastress, Oval, Collomsville and other Nippenose valley points. The officers of the company are: President, Wilbur Sallada, Williamsport; secretary, J. C. Carson, Du Boistown, and treasurer, J. H. Mutchler, of Nisbet.

LOYSVILLE, PA.—The Perry County Telephone Company has commenced the extension of the line from Bridgeport via Alinda and Falling Springs to Shermansdale.

MAINVILLE, PA.—At a recent meeting of the Mainville Telephone Company, it was decided to extend its lines through Beaver township to Ringtown.

SUSQUEHANNA, PA.—The Northeastern Pennsylvania Telephone Company has completed a long distance line from Jackson to Hartford, through Gibson to South Gibson.

HAMLIN, TEX.—The Orient-Santa Fe Telephone Company of Hamlin has just completed a direct copper wire line to Abilene.

NEWPORT, WASH.—The installation of the new telephone exchange in this city has been completed and service is now being given. The system is owned by Mr. R. S. Anderson, formerly of Sherwood, N. D.

SHERIDAN, WYO.—The Cheyenne River telephone line has been completed and instruments installed as far as Wm. Dixson's, eight miles from Hampshire.

FERNIE, B. C., CAN.—The Cranbrook, Light, Power & Telephone Company has received a contract to install a telephone system in the municipality of Fernie. Work will be started here at once.

KILLARNEY, MAN., CAN.—Tenders will be received by J. M. Baldwin, secretary-treasurer, until noon, October 12, for the construction of a rural line running from this town. Plans and specifications may be seen at the municipal offices here and also at the office of the Manitoba Telephone Commission, Winnipeg, Man.

RED DEER, ALTA., CAN.—The provincial government has commenced the erection of a new telephone line from Red Deer to Pine Lake, a distance of about 25 miles. A second line is being built to Hill End.

WINNIPEG, MAN., CAN.—The city council has voted $22,000 for work at the civic power plant at Lac du Bonnet. This includes $6,500 for a 24-mile telephone line. Cecil B. Smith is civic power expert and F. E. Cambridge, city electrician.

SWIFT CURRENT, SASK., CAN.—Work has been started on the installation of a telephone system in this place. It is expected that it will be in operation within six weeks.

ELECTIONS.

LOS ANGELES, CAL.—The Union Home Telephone & Telegraph Company at its annual meeting elected the following officers: President, Geo. B. Ellis; secretary, Fred E. Smith, and manager, Mr. Ellis, all of Los Angeles.

RAYMOND, MAINE.—At a local meeting of the Raymond and Webb's Mills Telephone Company, the following officers were re-elected: President, L. N. Jordan; secretary-treasurer, W. H. Witham. Directors, C. H. Thorpe, C. H. Cole and Charles Jordan.

HUNTSDALE, MO.—At a recent meeting of the Huntsdale Mutual Telephone Company C. Boggs, Jr., was elected president.

MISCELLANEOUS.

DE VALL'S BLUFF, ARK.—The Des Arc and De Vall's Bluff telephone exchange has been sold by Capt. J. M. McClintock to John I. Booe of this place and H. Nicholas of Des Arc.

NEW PLYMOUTH, IDAHO.—The Payette Valley Independent Telephone Company is planning to rebuild its line in this place. A new building is also contemplated.

SALEM, IA.—The plant of the Salem Telephone Company has been sold by M. G. Fraser to E. D. Kensinger; of Roswell, N. M., and will be known hereafter as the Kensinger Telephone Company.

ARCOLA, MISS.—The telephone exchange in this place was destroyed by a recent fire.

STEELE CITY, NEB.—The Steele City Telephone Company has purchased the plant of the Endicott Telephone Company.

BARTLESVILLE, OKLA.—The organization of an Independent telephone company is being agitated. It is expected that the promoters will apply for a charter in the near future. A raise in rates by the Pioneer Telephone Company is the cause of the agitation.

SALTILLO, TENN.—The exchange of the Statonville Telephone Company was recently destroyed by fire.

BEAUMONT, TEX.—N. W. Yeager, superintendent of the Beaumont Northwestern Telephone Company, which connects Kountze, Sour Lake, Kirbyville, Newton and other east Texas towns, made a recent visit to this place with a view of establishing headquarters in this city. The headquarters of the company at present are at Kountze, but it is thought that Beaumont is a more suitable location.

ROSSLAND, B. C., CAN.—A movement is on foot here to organize an Independent telephone company as the service furnished by the British Columbia Telephone Company is considered inadequate.

FORT WILLIAM, ONT., CAN.—The Bell Telephone Company's system in this place is to be purchased by the city, the purchase price being $6,000. The sale is contingent upon the purchase of the Bell Telephone Company's system in Port Arthur, negotiations for which are now in progress.

UNDERGROUND.

SAN BERNARDINO, CAL.—The Pacific Telephone and Telegraph Company is placing its wires underground in the business section of this city. This is in compliance with an order passed by the city counci over a year ago.

WATSONVILLE, CAL.—According to reports Watsonville is to have at least a part of an underground telephone system. It is stated that the wires along Main street will be placed in conduits and the present system of poles removed. The proposed improvements wil cost the telephone company about $2,500, and it is to be inaugurated in order to meet the increased demand for telephones.

INDIANAPOLIS, IND.—Fort Benjamin Harrison is to have an underground telephone system costing between $12,000 and $15,000. Lieutenant J. B. DeLancey will have charge of the construction.

DES MOINES, IA.—The Iowa Telephone Company is placing its wires underground in various parts of East Des Moines.

OGDEN, UTAH.—The city council has passed a resolution requiring the Rocky Mountain Bell Telephone Company to place all of its wires in the business district of the city underground within the next 90 days.

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Alphabetical Index

Absher Co., W. M. 24
American Circular Loom Co. . 3
American Elec. Fuse Co. 14
American Elec. Telo. Co. 26
American Electrical Works ... 26
American School of Correspondence 12
American Wood Preserving Co. 18
Andrae & Sons Co., Julius ... 6
Automatic Electric Co. 13
Backus-Judd Lbr. & Cooperage Co. 24
Baker & Co. 1
Beidler & Co., Francis 22
Belden Mfg. Co. 25
Blake Signal & Mfg. Co. 6
Brixey, W. R. 1
Brooks, Hall 24
C. A. Mfg. Co. 18
Chance Mfg. Co. 12
Chicago Telo. Supply Co. 1
Clay Product Co. 1
Commercial Elec. Supply Co. . 16
Connecticut Telo. & Elec. Co. 18
Cook, Frank B. 14
Coolidge, Marshall H. 24
Cracraft, Leich Elec. Mfg. Co. 4
Crumb & Co., W. H. 19
Deal Lbr. Co., L. K. 23
Dean Electric Co. 11
Detroit Insulated Wire Co. ... 1
Dregge-Grover Lbr. Co. 24
Doty Lumber & Shingle Co. . 23
Duluth Log Co. 21
Duplex Metals Co. 2
Durant Electric Supplies Co. . 24
Electric Specialty Co. 25
Electrical Engineering Co. ... 18
Electrical Trade Exposition Co. 20
Ericsson Tel. Mfg. Co., L. M. 9
Fahnestock Electric Co. 26
Faris & Mayhew Lbr. & Pole Co. 24
For Sale Advertisements 24
Fowle, Frank F. 19
Frankel Display Fixture Co. . 18
French Battery & Carbon Co. 2
Gould Storage Battery Co. ... 8
Gray Telo. Pay Station Co. ... 6
Griffen Lbr. Co., Geo. M. 23
Harding, Geo. 24
Holtzer-Cabot Elec. Co. 10
Hoyt Electrical Inst. Works . 18
Huebel Co., C. J. 23
Huron Rubber Co. 19
Indiana Rubber & Ins. Wire Co. 2
Indiana Steel & Wire Co. ... 2
Itasca Cedar Co. 24
Jackson, D. C., & Wm. B. ... 19
Johann & Johann 19
Jones & Winter 19
Kaye & Carter 24
Klein & Son, Mathias 26
Krueger & Grant Lbr. Co. 21
Land, Edmund 19
Lindsley Bros. Co. 21
Mansbridge, G. F. 26
Matthews, W. N. & Bros. 23
McMeen & Miller 19
McRoy Clay Works 1
Miller Anchor Co. 18
Milwaukee Elec. Specialties Co. 26
Minnesota Elec. Co. 12
Monarch Telo. Mfg. Co. 7
Mountain State Electrical Co. 4
Nash & Co., Geo. 10
National India Rubber Co. ... 26
National Pole Co. 22
Okonite Co., Ltd., The 1
Page & Hill Co. 23
Parker-Kenrick Cedar Co. 21
Partridge Lbr. Co., T. M. 23
Peirce Specialty Co. 3
Pendleton & Gilkey 23
Pignolet, Louis M. 18
Polk, W. C. 19
Protective Elec. Supply Co. ... 16
Reading Standard Co. 10
Roberts Telo. Co., Homer 6
Roebling & Sons, John A. 3
Runzel Lenz Elec. Mfg. Co. 3
Schwarze Electric Co. 26
Seymour Mfg. Co. 26
Simplex Electrical Co. 26
Skelley Mfg. Co. 8
Specialty Sales Co. 16
Standard Cedar & Lbr. Co. 24
Standard Telo. Mfg. Co. 4
Sterling & Son, W. C. 23
Sterling Electric Co. 17
Stevens, Chas. G. 1
Stone & Green 19
Stromberg-Carlson Telo. Mfg. Co. 5
Sumter Telo. Mfg. Co. 18
Swedish-American Telo. Mfg. Co. 15
Telephone Printing Co. 2
Trumbull Elec. Mfg. Co. 25
Veeder Mfg. Co. 10
United States Coin Register Co. 25
Universal Specialty Co. 16
Want Advertisements 24
Waterbury Co. 1
Western Lbr. & Pole Co. 21
Westinghouse Machine Co. 8
Weston Electrical Inst. Co. ... 12
Williams Test Clamp Co. 2
Wittenberg Cedar Co. 21
Worcester Co., C. H. 22
Wyckoff Pipe & Creosoting Co. 26
Yonkers Specialty Co. 1
Zabel, Max W. 19

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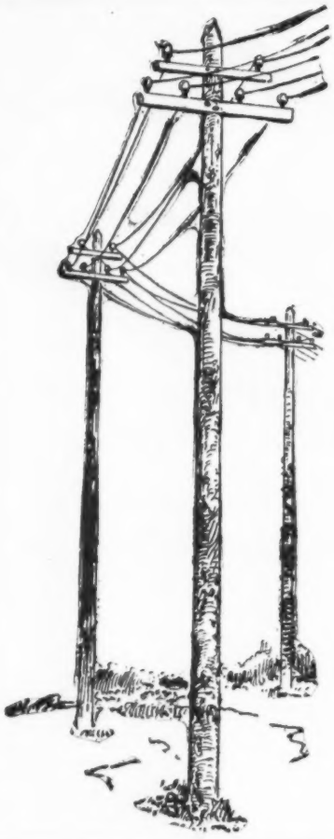

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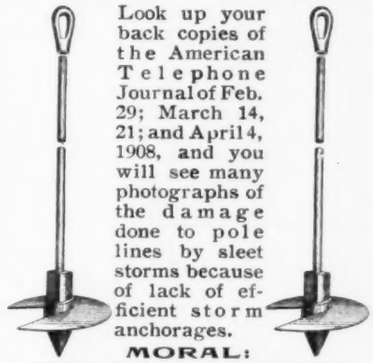

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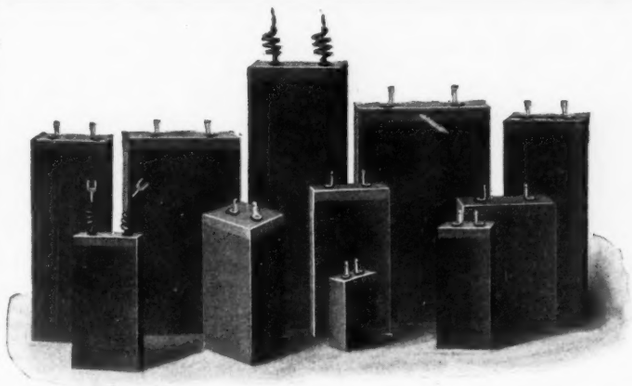

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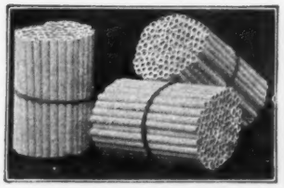

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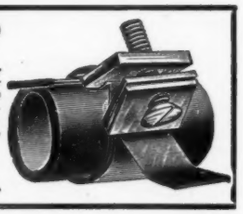

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